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## JOURNEY TO A RUBBER PLANTATION ON THE ISTHMUS OF COLUMBIA.

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THE well-known difficulty of investigating satisfactorily in Europe any of the numerous questions of importance connected with the collection of the latex frcm the rubber trees, its composition, and the most satisfactory manner of converting it into india-rubber, made the commission I received in the early part of this year, to inspect and report upon the state and possibilities of the extensive rubber plantation of the Las Cascadas Plantations Company, Limited, at the very outset an acceptable one. The fact that this plantation is situated in the Isthmus of Panama seemed to me a comparatively slight matter, although I must own to occasional apprehensive pangs on being treated by some of my friends, and others, to somewhat vivid descriptions of the terrors of mosquitos, malaria, yellow fever, and small-pox. I will say at once here that I found all these blood-curdling stories gross exaggerations. Colon is certainly an abominable hole, but had I to take the choice I would, without an instant's hesitation, prefer to live at Colon rather than in the slum districts of either London, Manchester, or Salford. The same, only more so, is to be said of Panama, which is a fairly well-built town upon rocky subsoil. Particularly the mosquito bogey appears to me an absurd exaggeration as far as the isthmus is concerned. Only once during the whole journey did I get really badly bitten; this was in my cabin on board the R.M.S. "Para" on the first night after leaving Jamaica for Colon. It appeared that besides taking in coal at that port, we had also shipped a liberal consignment of mosquitos.

The real trouble of an expedition like the one I undertook was never suggested to me; it consists in the fact that as soon as one leaves the beaten track (Colon to Panama) every trace of civilised comforts at once vanish. The food is artrociously bad, the cooking worse; all drinks even water taken direct from the streams, are at almost fever heat, and often there is nothing to be had but rain water. It is this bad food, the monotony of the diet, and the insipidity of tepid drinks which I felt to render a stay in the Tropics rather trying. Of course, on a plantation with a well-established settlement all these difficulties largely disappear.

As is well known the stretch of the isthmus from Colon to Panama, through which runs the track of the illustrated Panama Canal, is all low-lying, on the Colon side largely swampy land, the mean elevation of which above sea-level does certainly not exceed 80 feet. There are a number of banana plantations alongside, or within near distance of the canal track, but nothing of any magnitude.

Shortly after leaving Colon, the mountain ranges appearing in the far distance, south and south-west of the town, begin slowly to close in upon the track of the canal, coming eventually, near Panama, right upon it, and it is this hill district which, intersected by innumerable small rivers and brooks, very gradually rises to altitudes 1,200 feet and upwards, which furnishes at altitudes of from 200 to 800 feet, or perhaps even somewhat higher, the most suitable land for the cultivation of India-rubber, cacao, and coffee.

In this hill district, connected by their own road with Las Cascadas station, lies the plantation of the Las Cascadas Plantations Company, Limited, which comprise a total area of very many acres a large part of which is planted out with rubber (Castilloa elastica), cacao, and coffee. The number of rubber trees on the plantation now amounts to 70,000, of which 15,000 are from 11 to 12 years old.

After arriving upon the plantation and fitting up the laboratory required for the examination of the latex, and the testing of rubber on the spot, my first concern was to ascertain the exact species of the Castilloa on the plantation. This appear to me all the more important, as there is one species of Castilloa known which yields plenty of a latex, but one containing no rubber, and there appear to

* From the *India Rubber and Gutta-Percha Trades' Journal*, Sept. 29, 1902.

be several varieties yielding either a poor quality, or very little rubber. Of course, coming on the plantation in the rainy season, when the trees bear neither flowers nor seeds, was not exactly calculated to facilitate the botanical determination, and I was, therefore, compelled to make a fairly close study of the morphological and physiological feature of the trees. On the other hand, had to be borne in mind the fact that the whole of our present-day information respecting the botanical characteristics of the various species of Castilloa, and the respective value of each of them for cultivation purposes, are in quite a hopeless state of confusion.

According to the usual description Castilloa elastica is a tree growing to a height of from 36 to 54 feet, the trunk at about 3 feet above ground attaining to a diameter of from 24 to 48 inches. The bark is smooth and yellow. the wood soft and perishable. The leaves are from 6 to 12 inches in length, of a clear and brilliant green, and their lower side is more or less covered with a growth of fine brown hairs. Very characteristic of Castilloa elastica is the phenomenon known as dimorphism of the branches and which consists in the branches which spring from the tree at an angle of 45 degrees at a certain point rather abruptly taking up a horizontal position. I purposely omit entering here upon a discussion of the flowers and fruits of C. elastica as a comparison of their characteristics with those produced by the trees at Las Cascadas is at the present moment not possible. Cross, the well-known Kew botanist, describes these trees as growing to a height of from 160 to 180 feet, with a diameter of 5 feet, but he gives no information respecting the age of these trees. In all probability these trees were an enormous age, to be reckoned by centuries rather than tens of years. J. H. Hart, Superintendent Royal Botanic Gardens, Trinidad, states that the oldest Castilloa tree, there is over 75 feet high and has girth of 4 feet at three feet above ground. Some trees 15 years old are from 58 to 60 inches in a girth. Against these two authorities we posses however, the certain information that in Mexico, Honduras, Nicaragua, and Ecuador the height of C. elastica varies between 40 and 60 feet.

There are a number of other species or varieties of Castilloa, with regard to which a considerable amount of uncertainty exists. Indeed, only one of these, C. tunu Hemsley, is satisfactorily established as a distinct and different species, which, moreover, although containing a large quantity of latex, yields no india-rubber at all. The C. Markhamiana described by Collins as being found in the isthmus is considered by several very competent authorities not to be a Castilloa at all, but a Perebea. I searched everywhere for this species without ever coming across it, nor had any of the various experienced native collectors I questioned ever heard of any other but the Caucho tree (C. elastica.)

Koschay, in a letter which last year appeared in the March issue of the "Tropenpflanzer," describes four different Castilloa as occurring in Costa Rica. Of these C. tunu has already been mentioned. Of the rubber yielding Castilloa the best is the one possessing a whitish bark; it yields plenty of excellent rubber. Another variety has a black bark with a rough and irregular surface; it yields a rubber as good as the white variety, but the tree is rapidly exhausted. A further variety is characterised by a reddish bark, very thin and fragile; it yields very little latex, but the rubber produced of good quality.

To this must be added that the castilloa of Panama appears to differ from all other known varieties by the occasionally quite enormous size of the leaves. Leaves 20 inches in length occur very commonly, especially upon young trees. For this reason it has been suggested that the Castilloa of Panama is a separate species.

Now, as regards the trees at Las Cascadas, while at first sight they certainly strike one as typical Castilloa elastica, on closer examination show a number of differences which, at any rate in the absence of flowers, render the identification of the species none too easy. In the first instance, the bark of these trees, although very smooth, is certainly neither yellow nor white, but a delicate pale pinkish brown. The leaves even on the older trees are not very great, but still distinctly larger than the leaves on grown up trees of C. elastica in Guatemala, Honduras, Nicaragua, and Mexico. The hairy covering on the lower side of the leaves is much less striking, but the young leaf shoots at the end of the branches appear quite as densely haired as those of any typical Castilloa. Also the phenomenon above referred to as so characteristic of Castilloa is very strikingly displayed by all the Castilloa trees at Las Cascadas.

On the other hand, the only valueless specie of castilloa, C. tunu, is absolutely unknown on the isthmus, and in my wandering I have never encountered it.* It is equally certain that the Las Cascadas Castilloa is entirely different from Koschay's black and red varieties; the appearance of its bark could not possibly be described in the terms used by Koschay for the latter two trees. In how far Koschay's white Castilloa corresponds to the Las Cascadas tree is difficult to say. The bark of the latter might, with some appearance of justification. be described in Koschay's term as "whitish," but considering that the large silvery patches on it do not appear to be the actual colour of the bark, but seem to be due to a lichen, and considering further that all the lichen-free portions of the bark are by no means whitish, but as I stated before, of a light pinkish brown colour, I prefer to adhere to this latter description.

Taking all these points in conjunction it will readily be seen that the Las Cascadas rubber trees exhibit all the characteristics of Castilloa elastica in regard to the general appearance of the tree, the shape of the leaf, the hairy growth on the margin of the leaves, their under side, leaf stem, and the leaf shoots, as also the phenomenon already alluded to as the "dimorphism of the branches." I hold these data sufficiently conclusive to demonstrate that the Las Cascadas rubber tree is indeed the true Castilloa elastica. The fact that these trees produce a good yield of an excellent quality of rubber may well be taken as contributory evidence in the same direction.

As regards the unquestionable differences of these trees from the C. elastica as generally described, I cannot say that I ascribe any importance to them. Castilloa elastica posses es such an enormously wide geographical distribution—from lat. 6° S. to lat. 22° N.—it occurs under so very greatly varying conditions of soil, elevation, humidity, and temperature limits that it would be most extraordinary if it accommodated itself to all these different conditions without, at least some morphological change. Indeed, it seems highly probable that some of the varying statements regarding the growth of Castilloa elastica in different districts may find their explanation in the influence upon this tree of different climatic conditions. To some extent this may also be true with regard to the various conflicting statements regarding the yield of rubber obtainable from these trees.

On this question of the amount of rubber yielded by Castilloa elastica the information at our disposal from numerous sources is characterised by a degree of discrepancy perfectly appalling. According to Cross a Castilloa of from 18 to 24 inches in diameter produces 13 lb. of rubber annually, but he asserts that certain exceptional trees may yield as much as 100 lb. Collins observed that a 6 year old Castilloa possessing a diameter of 19 inches on being tapped in April, in the dry season furnished 20 gallons of

* Nor is it at all known, not even by hearsay, to the native rubber collectors on the Isthmus.

latex, from which 49 lb. of rubber were obtained and he declares this an average yield of all trees, the trunk of which, before branching out, reaches a height of from 18 to 27 feet above the soil. In Nicaragua it is found that from its sixth or seventh year a Castilloa tree yields from 4 to 6 lb. of rubber annually (Crawford). Dr. Morris states that a Castilloa, when first tapped, should yield 16 lb. of rubber. In Mexico, it appears to be generally assumed that Castilloa trees, when from 4 to 5 years old, will produce an average yield of 6 lb. of rubber. However, the "Bureau d' Informations Agricoles du Mexique" is rather more careful, giving the yield of the trees in question as amounting to from 4 to 5 lb. of *latex*, corresponding to 2 lb. 6 oz. of rubber.

J. H. Hart (Trinidad), states the yield of Castilloa as amounting to from 2 to 6 lb. but from quite a recent communication, I take it that an experimental tapping of one of his largest trees only produced about 14 oz. of rubber.

According to these above set out statements we would have to come to the delightful conclusion that, from its sixth or seventh year Castilloa elastica will yield from 6 to 49 lb. of rubber annually.

On the other hand, we have the results of the experiments of Dr. Trimen, Superintendent of the Botanical Gardens of Ceylon, and these results are as follows :—

| | | | |
|---|---|---|---|
| 5 years old. | Mean yield of 77 trees : | 2·3 oz. per tree. | |
| 6 ,, | ,, 61 ,, | 2·0 oz. | ,, |
| 8 ,, | ,, 61 ,, | 1·8 oz. | ,, |
| 12 ,, | ,, 61 ,, | 4·3 oz. | ,, |

My chief reason for quoting Dr. Trimen's figures is merely to call renewed attention to the absolute necessity of carefully ascertaining the yield of the Castilloa tree in any district in which it is intended to cultivate it. Dr. Trimen's figures can not be looked upon as representing the yield of Castilloa elastica anywhere but in Ceylon or Java, but they convey a vivid idea as to the extraordinary degree to which different conditions of soil and climate may affect the yield of rubber.

My own results obtained at Las Cascadas are as follows :—

| Age of tree. | Yield of latex. | Per cent. of rubber in latex. | Yield of rubber. |
|---|---|---|---|
| 6 | 1 lb. 13 oz. | 26 | 7·5 oz. |
| 7 | 2 ,, 5 ,, | 26 | 9·6 ,, |
| 8 | 3 ,, 1 ,, | 29 | 14 2 ,, |
| 11 | 5 ,, 3 ,, | 31 | 1 lb. 9·7 ,, |

As the trees can with perfect safety be tapped twice yearly, the annual rubber yield may be taken double that in the last column of the above table. These yields, as regards the trees of 8 and 11 years of age, respectively, are the means of a number of fully-developed trees of the two respective ages. The yields of the younger trees above given were obtained on tapping two representative trees of the respective ages, and taking the mean of the yield obtained as the real yield. I consider the above figures rather below than above the mark. But it is nevertheless well worth pointing out that as even Castilloa trees of the same age are apt to exhibit astonishing differences in their development it is only to be expected that they do so likewise as regards the quantity of rubber they produce, and it is, perhaps,' not an altogether safe procedure to ascertain the aggregate yield of a rubber plantation by simply multiplying the number of trees on the plantation with the, however carefully, ascertained yield of a limited number of trees. It is further my opinion that the method of planting and rearing young rubber plantations, always speaking of Castilloa elastica, is a matter deserving of much closer and more careful study than it has so far obtained. The method of simply planting out in a forest clearing so many seeds, or seedlings, at so many feet distance I consider, altogether inadequate. With this highly important matter I propose to deal at some future occasions.

The question regarding the best method of tapping the rubber trees is one which just now is engaging the attention of most of those occupied rubber planting. Of course, there are always the methods of the natives to fall back upon, but it could not be said that these are on the whole calculated to inspire much confidence this for the simple reason that the native collectors in all parts of the world never show the slightest regard for the trees they are tapping. If they do not actually cut the trees down, or in some other way deliberately bleed them to death, they still tap them with an utter disregard of all precautions for their preservation. Such methods are out of the question when we come to tap the trees on the rubber plantation. Here absolutely the first consideration is not only to conduct the tapping in such away as to preserve the life of the tree, but even to prevent this operation from injuring its vigour and growth.

TAPPING.

It does not require much demostration to show that the process of tapping must to a considerable extent depend upon the position, distribution, and arrangement of the laticiferous vessels in the trees. It is generally stated that the milk-ducts of rubber trees lie in the layer of bast underneath the bark, and that no milk-ducts are to be found in the inner parts of the trees, the wood or cambium. This as a general statement may be true enough, but it certainly does not strickly apply in the case of Castilloa elastica. If we chop one of the stout branches off a Castilloa tree, or, better still if we cut down a young tree, and carefully examine the cut, we can easily see with the naked eye that although the bulk of the exuding latex issues from the layer of bast immediately beneath the bark, still there are quite a number of apparently rather large milk-ducts distributed through the wood of the tree, and also that there is a considerable exudation in the lignefied tissues surrounding the pith centre of the trees; It will be a highly interesting problem to ascertain by a careful microscopic study of the various strata of the trunk of the Castilloa tree, whether there is any direct communication (anastomose between these widely separated milk-ducts in the various parts of the tree. How far similar conditions exist in other rubber trees I am at present unable to say, but it seems to me very improbable that castilloa stands alone in this respect.

Whether there is any communication between the milk-ducts in the different parts of the tissues of the trunk of Castilloa or not, can, however, not alter the fact that in tapping the trees on a rubber plantation only those layers of the trunk situated on its periphery can be drawn upon. Indeed, it is the layer of bast only immediately underlying the bark which is worth considering for tapping purposes, as it is generally admitted that any cuts into the wood of the tree are liable to permanently injure, or even altogether destroy it. It is, therefore, quite clear that as regards the rubber plantation entrusted to me one of the most important questions to be solved was to ascertain and decide upon the most satisfactory method of tapping the trees.

A microscopic examination of longitudinal sections of the bast layer of Castilloa at once revealed the fact that while this layer contains an enormous number of milk-ducts running longitudinally through the tissue, there are surprisingly little evidence of lateral intercommunication (anastomoses) between them. In exact agreement with this observation is the fact that longitudinal incisions produced an absurdly small flow of latex, indeed, in many cases none at all, this for the simple reason that the number of milk-ducts opened by a vertical incision is, in the absence of horizontal branchings, simply the number of milk-ducts occupying the width of the cut in the horizontal direction. Compared with the total number of milk-ducts in the layer of bast

surrounding the cambium the former number is, of course, insignificantly small. Moreover, we must bear in mind that the latex is held in the milk ducts by capillary force, and in order to obtain a flow of it from any incision we largely depend upon the pressure exerted upon these milk-ducts by the turgescence of the cellulose tissues of the tree. It will readily be seen that a vertical incision largely relieves this pressure, and consequently the flow of latex obtainable by such an incision will not even be proportional to the number of milk-ducts, however small, which have been cut into.

HORIZONTAL CUTS.

On the other hand, very little reflection will show that in applying a horizontal incision, not only do we open all the milk-ducts running through the area defined by that incision, but moreover the pressure due to the above mentioned turgescence is not in the least interferred with, and assists materially in producing a most copious flow of latex. It would, therefore, appear to follow that while vertical cuts are entirely useless, at any rate, as far as Castilloa elastica is concerned, horizontal cuts produce the maximum flow of latex, and a system of horizontal cuts therefore offers the best prospects for an effectual tapping of the trees. This, no doubt, is so, but the circumstance must not be overlooked that a horizontal cut is not very satisfactory for the gathering up of the exuding latex, this particularly in conjunction with the fact that a Castilloa tree cannot be drained by a single small horizontal cut as is, for instance, the case with Hevea, but requires a whole series of cuts. This renders it desirable that instead of tapping Castilloa with a number of small cuts a continuous cut would be preferable and one which drains practically the whole area of the trunk. There is only one cut of this descripton, and this is the one known as the spiral cut which, indeed, has always been largely employed by the native collectors exploiting Castilloa trees. I have, indeed, satisfied myself that the flow of latex obtainable from a spiral cut applied at an angle of not more than 45 degrees produces excellent results as far as the flow of latex is concerned.

There is also the repeatedly advocated system of an ascending series of V-shaped cuts, the apices of which are connected by a vertical cut which serves as a channel down which the milk is enabled to flow. In the first instance, I consider this vertical cut objectionable, as, while it defaces the tree, it does not contribute to the yield of latex obtained. Moreover, in the case of the Castilloa trees at Las Cascadas this vertical cut would be quite useless as the latex yielded by the trees issues from the cuts as a thick cream which does not flow, so that in this case the V-shaped cuts would only about have the effect of a double system of crossing spiral cuts.

The next question to be settled was the tool with which the above-named spiral cuts are to be applied. The instrument in universal use for this purpose throughout Central America is the "machete," a sort of cutlass. This formidable tool requires very dexterous handling in order to produce a regular cut, and even in the hands of the most experienced "hulero" produces and enormous mass of woody *debris* which clings to the cuts, and subsequently are taken up with the latex. The extraordinary mass of wood and bark in the Central American rubbers is entirely due to the tapping being performed with the machete. There is certainly no difficulty of removing from the latex these particles of wood and bark, but it goes without saying that if it should be possible to avoid this or any other contamination at the outset it is much to be preferred to any, however effectual, process of subsequently removing it from the latex.

A NEW TOOL.

For this reason a narrow plane has been recommended for the tapping of the trees, but there are several drawbacks to it. It certainly gives a perfectly continuous cut, and one free from the above-named *debris* but it very soon gets clogged. The layer of bast to be cut through in order to obtain the full yield of latex is very considerable, and necessitates the blade of the plane protruding very considerably a circumstance not calculated to faciliates its use. The thickness of the layer of bast to be cut through not only varies not inconsiderably from tree to tree, but it varies also in the same tree at different heights of the trunk. A plane gives under these conditions very little chance of adapting the depth of the cut to the depth of the layer of bast, and consequently, according to the setting of the plane either the layer of bast is not entirely penetrated, or the cuts pass more or less deeply into the wood istelf.

I therefore made experiments with a triangular cutting tool, the cutting edge of which is formed by one of the (rounded) angles, and after several modifications, I arrived at a form which answers the purpose admirably*. To cut or tap the trees with this instrument requires some experience but certainly very much less than the machete. The cuts are absolutely clean and continuous, and their width is naturally regulated by the cutting angle and the depth of bast to be cut through. This is exactly as it should be. For trees of different age, or of different diameter, tools with different cutting angles may be employed.

It has often been proposed to provide the instruments used for tapping with guards so as to prevent their penetrating into the wood. This is, no doubt, a very praiseworthy notion, but unfortunately one which it will be found practically impossible to adopt for the already stated reason that the thickness of the layer to be cut through varies within such wide limits as to render the proposal quite impracticable.

The just described tapping tool does not, of course, prevent the penetration of the cuts into the wood, though I may at once state that its liability to do so is certainly much less than with any instrument operated by striking, such as the adze, or machete. But in the experiments I conducted at Las Cascadas I gradually came to the conclusion, rather heretical in view of the nature of the numerous statements, on this point, that the tapping to begin with has surprisingly little effect upon the well-being of the tree, and further that cuts penetrating into the wood of Castilloa elastica, although they may retard the healing up of the wounds, are not necessarily injurious to the tree. They certainly do not affect its physiological functions, but only represent a danger as they offer a chance to certain insects to lay their eggs into the wood, so that subsequently the trees may suffer from, or even succumb to the ravages of the larvæ and insects (wood-burrowing) beetles) emanating from these eggs. But this danger is easily avoided by painting the cuts after the collection of the latex and "scraps" with an antiseptic paint. It also appears that this simple and inexpensive treatment assists materially in the healing of these cuts, as all the cuts thus treated began to heal up already within a week after the tapping.

*(To be concluded.)*

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## VANILLA.

CULTIVATION IN THE SEYCHELLES.

(*Concluded from Page 160*--Sept. 1902.)

CURING THE PODS FOR MARKET.

There are many different modes of preparing vanilla, but for brevity's sake one alone will be described; it is probably the simplest, and appears to be as successful as any other. About 400 of the longest pods are placed in a basket and plunged into hot

* I shall revert to this subject in a subsequent paper.

water (190° F.) for ten seconds; this is repeated twice, the dips being increased to twelve and fifteen seconds respectively, with intervals of half a minute between each two. After the third dip, when most of the water has drained off the pods are placed in a wooden box or barrel lined with blankets, and closely covered up with the same material. When lot 1 is finished, lot 2 is similarly treated, and for them the water may be a few degrees cooler, or the dipping times a trifle shortened; and so also with lot No. 3, while No. 4 may be treated as No. 2. Perhaps it is as well to add that 190° F. is not an absolutely essential heat, but it is about as high as it is safe to go; while even the longest pods may be adequately treated in water at 170° F. if they are kept in it long enough. An experienced preparer will be guided more by the appearance of the pod after each dip than by any fixed formula. When small quantities are dealt with less heat is needed, and the above figures are given for a boiler 22 inches in diameter by 12 inches deep. It is best to have good-sized boxes or barrels to sweat the pods in, those holding 2,000 or 3,000 each being preferable, for the more pods there are together the better heat is retained. The lots (1, 2, 3, and 4) should be kept apart, a fold of blanket being laid on each if all go into one box. By the following morning they should have changed to chocolate or puce colour, and are then ready to spread on the drying shelves; but if there is a large number together, and the heat has been well kept in, they may be left for another twenty-four hours.

A curing house for preparing a crop up to 2,000 pounds (dry) may have the following dimensions and fixings: 30 feet long, 15 feet broad, 13 feet in height of walls. It should be divided into four counterparts, two on the ground and two above, each being approximately 15 by 15 and 6½ feet high. One compartment on the ground floor is used as a hot room, having a flue 2 feet wide covered sheet iron running through the centre. If the heat is too intense from this, sand may be sprinkled on top to reduce it. Above this flue and around two sides of the hot chamber tiers of shelves are fixed 6 inches apart, on which the pods are spread to dry. The shelves may be conveniently made of laths, on top of which mats or canvas can be laid, or fine-meshed wire netting would serve the same purpose, perhaps, better than anything else. . . . The worker, sitting on the floor, keeps the four lots of pods—long, medium, short, and split—distinct on the shelves. This facilitates the sorting, the short and split pods needing to be examined sooner and oftener than the longer and sound sorts, as they dry more rapidly.

A good average heat for the hot chamber is 110° F. A few degrees more or less does not matter, but pods are apt to dry too quickly if the heat is much greater. The slower the progress the more uniform and better is the result. As they being to turn soft and show longitudinal wrinkles the pods are removed from room 1 to 3, and after reaching a certain degree of flexibility they pass on to the shelves in room 4 and there finish their curing. If kept too long in either a hot or warm room the thin ends of pods shrink too quickly, and this is to be avoided. In a large crop there are always some inferior, ill-nourished pods in which this occurs, but the last remark will be useful to a beginner. When fully cured the pods are much wrinkled and pliable, bending easily around one's finger. There is considerable difference in the degree of dryness preferred by different curers. If the contents move easily all along a pod, without any unevenness being noticed when it is drawn between the finger and thumb, it is nearly dry enough; but the right stage can only be learned by experience. When finished the pods are well wiped with bits of soft flannel and then kept in boxes with close fitting lids. It is better to sort them roughly into lengths as each day's lot is put away, and tie up the various sizes in bundles of about 200 each if the numbers allow of it, for they have to be examined once or twice a week in order to remove the moulded ones, and this is much more quickly done with bundles than when they are loose. Moreover, it makes the ultimate accurate measuring easier. Either at this time or later the different qualities are more exactly separated, none but faultless pods, without scar or defect in curing, being allowed in the first quality. The rest rank as seconds, etc. The split pods and the pods that have been cut on account of mould are also kept distinct. It is well to keep a crop at least three or four months before marketing. By that time nearly all shaky pods that are liable to mould will have shown themselves. All are then measured and tied up in neat bundles of 50 pods each of even length, the pods varying in length not more than one-eighth of an inch.

The general sightliness of a marketed crop has much influence on the price it will bring, and whatever whims buyers get into their heads the producer must conform to or suffer in pocket. Bundle tying is somethig of an art, and a deft hand at it is valuable. Sixteen or thereabouts of the shapliest pods in each 50 are selected for the outside; the rest are tied up as a core, being kept in position by a few turns of the fibre-tying cord, while the chosen sixteen are carefully placed round them. The bundle is tied in either three places, near each end and in the middle, or in two places, an inch or more from the ends, according to the length of bundle. The core-holding string is pulled out before the final tie is fixed. Two-tie packets are boxed as they are. With those of three ties buyers prefer that the end cords be removed before packing, to enable them to examine the bundles inside and see if the contents are of uniform quality. If kept tied some time before being packed the bundles set, as it were and retain their neat shape. The tin boxes used here fore packing vanilla in measure 12½ by 8¼ inches in width, are 4½ inches deep, and hold about 12 pounds. Each box has a label pasted on it which bears the growers trade mark, the length and number of packets, their quality, and net weigh, and a similar label is put inside. As some chemical action is set up when vanilla rests in contact with tin or iron, thin vegetable parchment paper is placed in the boxes to keep the two apart, The lids are then sealed close with pasted paper and the tins packed in wooden cases, six in each, and thus dispatched to market.—*Agricultural News.*

## VANILLA.

The fruit of the *Vanilla planifolia Andr.* does not give out the characteristic odour of vanilla when freshly gathered; and it is only after the subsequent preparations that this odour is gradually developed. While writing a work on this subject for Planters in the French colonies M. Henri Lecomte found that this preparation which gives very variable results, is purely empirical; and he was induced to study the conditions under which vanilla is produced. The following particulars are taken from his notes on the subject communicated to the Paris Academy of Science by M. Guignard. At the outset M. Lecomte discovered, in the various parts of the vanilla plant, the constant presence of an oxidising ferment similar to those studied by M. G. Bertrand, and which are now known by the general denomination of "oxydases," their presence being noticed in the stalks and leaves of the plant, the liquid extracted from them, the green and ripe fruit, and also the prepared vanilla from Mexico, La Réunion, the Seychelles, and the Comores.

Strangely enough, while the most esteemed vanillas of commerce contain the oxydases in considerable proportion, those of inferior quality do not contain them at all, or only to a very slight extent. The

presence of manganese, which M. Bertrand regards as the vehicle of the oxygen, was noticed in all the matters at the author's disposal.

The above observations led to the belief that the oxydases contained in the fruit of the vanilla must play an important part in the preparation of the essence itself; but an apparently serious objection may be opposed to this supposition. In the method of preparation now adopted at La Réunion, the first operation to which the fruit is subjected consists in immersing it for about twenty seconds in water kept at the temperature of 80 to 85 degrees Centigrade. Now at this temperature the oxydases might be supposed to lose their characteristic property but experiments, repeated several times, showed that the interior of the fruit, immersed in boiling water for thirty seconds, did not acquire, after such immersion, a temperature higher than 55 degrees Centigrade. Now, in practice, whole basketsful of the fruit are immersed in hot water, which does not attain boiling point, but at most 85 degrees Centigrade while the immersion only lasts for twenty instead of thirty seconds. It may therefore be concluded that the temperature inside the fruit never attain 50 degrees Centigrade, and that under these conditions, not only is the oxydase not altered but that on the contrary the temperature it acquires is that which is very favourable to preservation of the essential properties.

There remained to determine the nature of the substances capable of being transformed into vanilla, under the influence of the oxidising agent. Following up this investigation, Mr. Lecomte found that the juice extracted from the vanilla plant contains another ferment possessing the property of hydratizing the starch and which, acting on a solution of coniferine, promotes the formation of a substances possessing the same reactions as that the constant presence of which was noticed in the tissues of the vanilla plant. The simultaneous presence of two distinct ferments, one hydratizing and the other oxidising, the existence of which appears intimately connected with the production of vanilline was, therefore, noticed in the vanilla plant.

In fact, having selected two similar specimens, A and B, of ripe fruit, forwarded in spirit from La Réunion, the author proceeded to prepare them by boiling. Specimen A was first raised to a temperature of 100 degrees Centigrade for ten minutes, while B was not subjected to this operation, the two specimens being otherwise prepared in the same manner and in the same space of time. Specimen A became soft, and only gave out a scarcely perceptible odour of vanilla; but B on the contrary assumed the characteristic odour of vanilla, while having become partially covered, after a few days, with small crystals, which were easily recognised as those of vanilline.

By way of conclusion, the following hypothesis may be ventured as to the formation of vanilline in the fruit during its preparation:—The hydratizing ferment may be supposed to transform the nascent coniferine into coniferylic alcohol and glucose, the presence of which latter substance is indeed constant in vanilla; and moreover, the coniferylic alcohol is probably transformed into vanilline by the action of the oxydase.—*Journal of the Society of Arts.*

## THE CACAO FUNGUS.

By ALBERT HOWARD, B.A.; A.R.C.S., F.L.S.,

*Mycologist to the Imperial Department of Agriculture for the West Indies, late Scholar of St. John's College, Cambridge.*

The Fungus found on the pods and branches of the cacao tree agrees, as far as the characters of the pycnidia and spores go, exactly with the form described above on the sugar-cane. In the case of the pods the pycnidia are often formed singly just under the epidermis, and the latter is ruptured by the growth of these structures. In diseased branches, or on the trunk of the tree, the pycnidia occur usually in colonies just under the bark. The appearance of a branch attacked by the Fungus, which has been kept in a moist chamber a short time, is shown in Fig. 10, and a transverse section through one of the colonies is given in Fig 11.

Some general indication of the appearance of cacao trees and pods apparently attacked by this Fungus may be of interest. It is quite common in Grenada to see cacao trees dying back to a slight extent at the extremities of the branches, a phenomenon probably due to poverty of soil, wind, drought, or defective root-action, or perhaps to a combination of these causes. In all such cases there is a sharp line of demarcation between the dead and living tissues, and although several Ascomycetes are to be found in the dead wood, they appear to be purely saprophytic in character. In many cases, however, dying back goes on to a very great extent, extending to the larger branches and the trunk, and, in spite of the production of suckers at the base, the trees are often killed outright. In such cases there is no boundary line between dead and living tissues, but an intermediate zone, often as much as two feet in length, always occurs between the obviously dead and living tissue. Mycelium can be easily detected in the young wood in this transition region, and the pycnidia referred to above are to be found under the bark. The mycelium can be detected in the wood at some distance in advance of the point at which it seems to end in the bast, a point which seems to indicate the saprophytic origin of the Fungus The mycelium makes its way in the wood from element to element by means of the pits in the walls of the vessels and cells, and where the hyphae have commenced to darken in colour this point can be determined without staining (Fig. 12).

In cases where pods are apparently attacked by the Fungus this is very common near the 'breaking-grounds,' where the 'beans' are extracted by the pickers, and where it is the custom to leave the empty husks on the ground in heaps. The husks speedily become covered with the spores of the Fungus, as this form lives on them as a saprophyte. The rind of the pod turns brown and mycelium soon spreads to the mucilage surrounding the seeds completely destroying the pod and its contents, usually in from six to ten days. The diseased areas commence as a brown spot, as a general rule either at the free end of the pod, or in the groove round the insertion of the stalk, or at the point where the pod come in contact with the branch. These places are those which are liable to be moist long after the rest of the pod is dry, and indicate the probability that infection may here be effected by spores without any previous wounding.

The artificial cultivation of the Fungus was carried out in an exactly similar manner to that employed in the case of the sugar-cane Fungus described above and as far as possible similar cultures of the two forms were made and examined at the same time.

Stages in the germination of the spore are shown in Fig. 13. The germtube grows out into a long hypha, at first slowly, but afterwards much more rapidly, and extensive branching eventually takes place. Septation of the hyphae was not noted before twenty hours after sowing, and after two days fusions of the hyphae were common: about the same time the mycelium commenced to grow down towards the water on the floor of the moist chamber, reaching it four days after sowing (Fig. 7). When three days old the mycelium gradually changed colour, passing through various shades from light yellow to olive green, and at the same time the hyphal contents began to aggregate in certain portions of the mycelium, leaving the rest empty. Oil drops also made their appearance. The appearance of the mycelium, when eight days old, closely resembles

that shown in Fig, 8. No further development was noted in hanging-drops, except that the thickwalled oil containing hyphae became dark brown three weeks after sowing, and appeared identical with the old mycelium described above in the case of the cane Fungus. As in the sugar-cane Fungus, advantage was taken of the aerial development of mycelium in single-spore hanging-drops to prepare cultures free from Bacteria.

In plate-cultures in the cane extract medium a copious development of greyish mycelium was obtained on the third day, which formed a dense velvety pile, a quarter of an inch in height, on the surface of the gelatine, and in which dark bodies could be detected with the naked eye. When examined on the sixth day these dark bodies were found to be pycnidia in which paraphyses and spore formation could be detected, after the manner indicated in Fig. 9.

On sterilized cacao and oak-wood small dark bodies were noted in nine days, and these when twenty days old proved to be the pycnidia of the Fungus.

It will be seen therefore that the development, under artificial conditions, of the Fungus of the cacao tree corresponds exactly in all its details with that found on the sugar-cane, so that morphologically regarded the two forms are identical.

It was now necessary to perform infection-experiments on cacao trees and pods, with pure cultivations of the Fungus.

These were as follows :—

1. On cacao pods :

(*a*) Two nearly ripe pods were selected for the experiment, and were washed with alcoholic corrosive sublimate, and at the points where incisions were to be made small cavities were made in the rind by lifting the surface and cutting out a small portion of the tissues underneath. Into one of these chambers actively growing mycelium, three days old and from a pure culture, was introduced and the pod was bound up with budding-tape. The other pod was treated in a similar way, except that no mycelium was introduced and thus served as a control. Five days afterwards, about a quarter of the surface of the infected pod had turned brown, and in eight days after infection the whole of the surface was deep brown, and there was a considerable development of pycnidia for some distance round the point of infection. The protrusion of the spores as a greyish 'tendril,' visible to the naked eye, from the ostiole of the pycnidium, and their gradual darkening were beautifully shown on this pod. Near the point of infection the spores were visible as a black dust on the surface of the pod, and in most cases the 'tendrils' had broken down into their constituent spores, each showing the transverse wall and the dark-brown colouration under the microscope. Further away the colour of the spores became lighter and 'tendrils' were more numerous These were composed of spores loosely cemented together, in which the transverse wall had not yet appeared. The control pod in this experiment showed no infection.

(*b*) The above preliminary experiment was repeated and in this case two nearly ripe pods were infected with mycelium, and a third was used as a control. Distinct infection took place in three days while the control gave negative results.

(*c*) Next, four half-grown pods were selected for experiment, in order to determine whether the spread of the Fungus is as rapid here as in nearly ripe pods. In each case small cavities were made in the rind, and in the first pod ripe spores from the infected pod in experiment (*a*) above were placed in the cavity. In the second pod a portion of the rind containing growing mycelium from the infected pod (*a*) above was introduced, and in the third pod actively growing mycelium from a pure culture was used for infection. The fourth pod served as a control. Seven days afterwards distinct infection was noted in the first pod, the rind having turned brown about a quarter of an inch all round the cavity, and in the discoloured tissue mycelium was extremely abundant. In the second pod infection had proceeded further, about one square inch of the surface being attacked. In the third pod about six square inches of the surface was decayed, and it was found that the mycelium had penetrated to the mucilage surrounding the seeds and had completely invaded the interior of the pod. Numerous pycnida were observed under the epidermis near the point of infection. The control pod gave negative results. This experiment is of some interest as it throws light on the steps by which a saprophytic form may gradually become parasitic, and confirms previous observations on the influence of a nutritious food-material in increasing the activity of a Fungus.

(*d*) Next, a preliminary experiment was performed on two nearly ripe cacao-pods, in order to determine whether infection could be produced by spores without previously wounding the rind. A drop of sterile water containing spores was placed on the surface of the pod, and was covered by a small glass cell which was sealed on to the rind by means of budding wax. The cell was covered with a dark bandage to shield the spores from direct sunlight. Seven days afterwards the spores had developed a mycelium on the pod, but penetration of the intact rind by mycelium was not noted in either case. Unfortunately time did not permit of carrying out further experiments to settle this point definitely ; but a consideration of natural infections seems to indicate that pods at any rate are capable of being infected by germinating spores directly. If this were not the case it is difficult to explain why infection almost always begins at those points on the pod which are moist for the longest time, viz. the free end of the pod, the groove at the insertion of the stalk, and the place where pods come in contact with the branches.

2. On the cacao trees :

In the infection-experiments performed on the cacao tree itself, a small portion of the outer dry bark was carefully removed and the exposed bast washed with sterile water. A small chamber was made by raising the bark and cutting out a small portion of the bast down to the cambium. After introducing the infecting material, the barklid of this chamber was depressed and the whole covered with a water-tight bandage of budding tape. The control plants were treated in the same way, except that no mycelium or spores were purposely introduced into the cavity.

(*a*) Two branches of a healthy cacao tree were selected for the preliminary experiment In one cavity actively growing mycelium in the cane-extract medium was introduced, while the other branch was used as a control. Eight days after infection the Fungus had killed the bast up to about eight inches above and below the chamber, at which point the branch was nearly ringed. The mycelium could be traced more than a foot above and below the chamber, both in the bast and in the wood, and to a considerable depth in the latter. Numerous pycnidia were developed under the attacked bark, some of which were liberating their spores. The control showed no infection.

(*b*) Eight healthy cacao plants about eight months old, growing in bamboo pots, were next selected for an experiment. Nos. 1 and 2 were infected with spores taken from a pod attacked by the Fungus, 3 and 4 with portions of the diseased rind of a pod containing actively growing mycelium, 4 and 5 with vigorous mycelium from a pure culture in cane extract and 7 and 8 were control plants. After binding up the wounds the plants were placed in the shade and watered daily. Eight days afterwards it was found that infection had taken place in all the plants from 1 to 6, while the control plants showed no infection. There was scarcely any difference in the amount of infection when spores or diseased cacao-pod rind were used, except that plant No. 1 was killed outright by the Fungus. When culture-mycelium was used

infection was more extensive, one of the plants being killed while the other was evidently dying. In each case (5 and 6) pycnidia were formed under the rind.

(c) Four vigorous young trees about eighteen months old were now selected. The first was used as a control, the second was infected with spores, the third with a portion of a diseased pod taken from near the still healthy tissue, and the fourth with pure culture-mycelium. Eight days afterwards distinct infection was noted in No 2, while in Nos. 3 and 4 the trees were nearly ringed near the infection chamber, and the mycelium could be tracted in the bast and wood as far as six inches above and below this point. Pycnidia were noted under the bark near the chamber. The control tree showed no infection.

(d) Attempts to induce infection by spores growing in water on the bark, in a manner similar to that used in experiment 1 (b) above, failed. The spores germinated, but I could not detect any penetration of the living tissues by the hyphae.

These infection-experiments show that the Fungus can behave as a parasite towards cacao pods, and is a dangerous wound-parasite of the cacao tree itself. The nature of one of the tree diseases in Grenada, and of an important pod-disease, is therefore placed beyond doubt.

## CULTURE OF THE PASSION VINE.

Mr. G. Alderton, jun., writes:—"Would you kindly give me information *re* culture of passion vines and your opinion on prospects of growing same in a soil growing blackbutts, redgum, and stringybark. The soil in one part is composed of from one to two feet in depth of sandy loam, and in others,it is more of a sandy reddish clay. The latter is the heavier and moisture soil, but I fancy the other, because the situation is higher and the aspect is easterly. I propose to raise the passion vine from seeds sown in a seed-bed in spring, and transplanting to rows of, say 10 feet x 12 feet. Is this distance correct, and would it be best to trellis fence fashion, which would mean hand-hoeing all between the plants one way, or could I use trellises high enough for horse-work each way?

I also intend to grow tomatoes between rows while vines are small. I mention this, as a market gardener told me he would not grow tomatoes on his farm, as the land will grow nothing after them.

Would you advise pruning passion vines each year, say, leaving a main leader to top rail of trellis, and pruning all laterals back to same each year (between growths)?

Would Jordan almonds bear in this district? The elevation is about 500 or 600 feet, and nearly free from frost?"

In reply, the Fruit Expert, Mr. W. J. Allen, expresses the opinion that the sandy loam referred to should grow good passion fruit, provided the frosts are not too severe. The vines would not do so well on the more clayey red soil. If it were a red sandy loam they would probably do well, but generally speaking, they do not do well when planted in heavy soil. Ten feet by 12 feet apart is as close as passion vines should be planted in rich ground, and they are better a little further apart. The best form of trellis is one of posts and wire, with a post between every second vine projecting 5 feet out of the ground; on the top of the posts are fastened two wires about 6 or 8 inches apart, the vine to be trained up a stick or small pole until it reaches the wires, then trained along the latter. Mr. Allen would not recommend a higher trellis than 5 feet. A good man with a horse and cultivator can work nearly all the ground without having to do much handwork. Mr. Allen would not advise growing anything between the vines unless manure is applied literally, as, if the plantation is expected to pay, the ground must not be robbed of its best properties by rapidly maturing crops before the vines themselves have come into bearing. It would be a great advantage to the vines if it were possible to lime the ground before planting. The dressing in the case of soil indicated should be at the rate of not more than one ton per acre.—*Agricultural Gazette of N. S. Wales*

## PLANTING NOTES.

Insect Tormentors of Horses.—The *Chasseur illustré* says that a decoction of 1 part of stramonium leaves to 3 parts of water, boiled for 20 minutes and applied, when cool, to the face, about the ears, inside the legs, about the belly and croup, is sufficient to keep a horse free from its insect tormentors during a whole day. Stramonium is said to be much efficacious when thus used than tobacco.—*Queensland Agricultural Journal.*

The Cure of Snake-Bite.—In an article recently published on the prevention of deaths from snake-bites, M Henri de Parville cites several well-authenticated cases in which the anti-venomous serum of Dr. Calmette, head of the Pasteur Institute at Lille, has been the means of saving life. Dr. Calmette, it may be remembered, was himself bitten on the hand by a cobra when experimenting in his laboratory a short time ago, and only escaped death by the application of the serum discovered by himself. A mining engineer, in a letter to the writer from Australia, also relates how he was bitten in October by a deadly serpent, and an hour afterwards was fast losing consciousness, when the timely intervention of Dr. Calmatte's antidote brought him back to life. But the most striking testimony to the value of the French professor's serum comes from India, where a was woman recently bitten by a venomous snake of unusually large dimensions, and cured when she was at the point of death. To prepare the serum, the venom has to be procured from living serpents, and it was while engaged in this risky operation that Dr. Calmatte came near losing his life. The Pasteur Institutes at Lille and Paris forward consignments of the saving serum to all countries in which venomous serpents are found.—*Australian Field.*

Precautions to be Taken by Consumers of Vegetables.—We (*La Revue Agricole de l' Ile Maurice*) think it will be useful to reproduce a paragraph inserted in the *Agriculture Moderne* relative to the treatment which raw vegetables should undergo before being eaten. The recommendations by Dr. Ceserole have all the more importance in hygiene, as market garden produce in the colonies is often treated with liquid manure. It has for a long time been known that intestinal worms are generally transmitted to us through the medium of vegetables. Dr. Ceserole, of Padua, has devoted careful study to the subject; he has examined the sediment of sterilised water in which various market vegetables had been washed, such as lettuce, endive, radish, celery, &c. The microscope revealed in this water the presence of fifty-two common species of fauna. But, besides these parasites, Dr. Ceserole found a number of microbes—notably, a bacillus analogous to that of typhoid fever, the septic bacillus, and the bacillus of tetanus. This infection of the vegetables is especially to be imputed to watering them with liquid manure. Great care has consequently to be exercised. Lately, Metchnikof, of the pasteur Institute, has discovered that a certain number of parasites appeared to have their origin in intestinal worms. Dr. Ceserole recommends that, to avoid danger, the vegetables previously well washed should be plunged for half-an-hour into a 3 per cent. solution of tartaric acid, which has an agreeable flavour, is cheap, and of great antiseptic power.—*Queensland Agricultural Journal.*

## AN EXTENSIVE APPLE ORCHARD.

A company composed of representative horticulturists in Iowa and Missouri has been organised with a capital stock of $1,000,000, for the planting of what it is claimed is to be the largest orchard in the world. This orchard is to cover 5,000 acres of ground planted with 50 trees to the acre. The land for this experiment has been chosen in Laclede County, Missouri, about 150 miles southwest of St. Louis. This choice has been made because of the discovery that apples grown in this county have taken the first prize in competition with most of the other countries in the same State, which is peculiarly adapted both in soil and climate to the successful growth of fruit crops. About 100 acres of this land will be planted with trees next spring, and it is estimated that within six years the whole of the orchard will be bearing fruit. While the main object of the company is that of raising apples, many peach and other trees devoted to small fruit will be planted during the first years, in order to produce an early dividend upon the investment. The underlying principle of the company which is undertaking this work is that co-operation of a commercial character can be developed under the direction of men skilled in business and horticulture, and that if this assumption is correct, the venture can be made more profitable than is possible from individual investments in the same line, and that too the chances of loss incident to such investments when made in a small way are not so great. It is estimated that each of the 250,000 trees to be planted on this area will produce five bushels of apples thus making a total yield of 1,250,000 bushels, equivalent to about 500,000 barrels. It is expected that the bulk of this crop will be exported to Europe. During the fiscal year of 1901 the export of apples from the United States was 840,605 bushles, of which 794,660 were sent to the United Kingdom. As showing some of the methods to be adopted, a cold storage plant will be built in St Louis as soon as this orchard has come into bearing. This will be the main shipping point and it is intended that the storage plant shall have a capacity for 150,000 bushels. Another interesting feature of the work is the announcement that the St Louis and San Francisco Railroad has taken such an active interest in the plans of the company that it has agreed to construct a branch of about 3½ miles through the property. It will also build at frequent intervals along the line of this branch warehouses which, it is expected, will facilitate the prompt handling of the crop.—London *Times*, Oct. 4.

## COCONUT PLANTING IN CEYLON:

### SUCCESS IN DRY DISTRICTS: HOW TO GET APPROXIMATE AREA.

*(By a Veteran.)*

The number of coconut estates in the island that pay R100 an acre of profit may be counted on the fingers of your two hands. I was up in the Rajakadaluwa District two months ago, and an estate about a mile this side of Battuluoya, belonging to a native, just nearly made me envious. I never expected to see such bearing and such fine trees in a district with only 54 inches of rain—what I saw there and 15 miles



farther North on the road to Puttalam has caused me to modify considerably my views as to the bearing capabilities of the coconut palm incomparatively dry regions so long as the soil is free.

Although headmen's reports are not very reliable, they are the only means of knowing the acreage of the thousands of small gardens planted with coconuts in the different districts. It would be impossible for any European to get reliable information on this matter, and it would be only a very unreliable guess to try and form an estimate.

I am afraid you must be content with the information you can get through the different Kachcheris. [Until the Cadastral survey is closed. —Ed. *C.O.*]

## RICE-CROP PROSPECTS, 1902-03, IN BURMAH.

The District Officers' reports on the rice-crop prospects on the 30th September 1902 in the 14 chief rice-producing districts of Lower Burma are to the following effect:—

*Summary.*—The estimated area under rice in the 14 principal rice-growing districts is reported to be 6,649,006 areas against 6,558,190 acres actually cultivated last year. Amherst reports on unexplained increase of 28,900 acres, and Pegu, Toungoo and Hanthawaddy report increases of over 10,000 acres. Floods have caused damage in Tharrawaddy and Thôngwa and have caused a decrease in cultivation in Henzada. In Myaungmya the fallow area is large owing to cattle disease and sickness among the cultivators, and in Prome owing to untimely rainfall. Otherwise prospects are bright.

## THE TEA BUG OF ASSAM: IMPORTANT DISCOVERY BY MR. MANN.

Calcutta, Nov. 10, 7·55 a.m.

Mr. Mann, Scientific Adviser to the Planters, states that the Tea Bug in Assam is found from eggs onwards on the tea bushes and not in the ground.

## THE STORY OF THE JAK TREE.

Mr. Carruthers' Lecture, the second one of the "Kandy Popular Lectures," was given at the Town Hall on Monday evening before a large and appreciative audience. The evening was fine, the lecturer in excellent form, the Chairman (Hon Mr H Wace) jocative and the audience good-humoured. With these conditions combined "nobody could deny" that the lecture was a success. The lecturer (I cannot help calling him so) took pains to say his was not a "lecture." Of course, all knew only one, who rose to the heights of a "lecturer"—and that was, that grand old dame, Mrs Caudle. As the Town Hall is devoid of mosquito curtains, the members of the male sex felt safe and happy that there was to be no "lecture." Mr Carruthers said, he was going to treat us to "The Story of the Jak Tree." Delightful visions of dear old Hans Charles Andersen and Mrs Prosser rose into our minds and we, indeed, got them reproduced in another form. The seed in its embryo state to the plant, the radicle, roots, stem and leaves and the flowers were described in a free and easy style. There was hardly anything of the technical. The lecture was illustrated by lantern slides from the "cradle" to plant-life. The drawings for the slides were stated to have been very good, but by the time they had to be shown they had

faded a good deal and were not very distinct on the screen. One especially when it came up, he described it heaving a deep sigh, as being in "the sere and yellow leaf." In his observations of tree and plant-life in the Gardens one bright moon-light while noting down, he of all people mistook a papaw tree for a cot on tree. You know, Sir, he is not the only one that has been moon struck. Many of us can freely confess to that experience once or more in their lives. It proves the truism, clearly, that the best of us after all is human.

The hour ran out much too fast and the worthy lecturer had reluctantly to close "The story of the Jak Tree." It was a good story.—Mr De Saram, the District Judge, moved a vote of thanks to the lecturer. It was judicially delivered without one *if* or *but*, short and sweet. Mr Copleston seconded and announced that two reading circles had been formed. The audience as they got into the Hall were given a leaflet entitled "Notes for Students," being "an advance" introduction to the lecture which simplified it. It goes without saying that these educational efforts are due to the indefatigable exertions of the Honorary Secretary, Miss Gibbon. The next lecture will be "Charles Dickens." A good many are endeavouring to read up his life and works to be *en courant* with the lecturer. The Secretary will, I am sure, be delighted to hear this piece of news. It will be next month and "may I be there to see."

## CULTIVATION OF COTTON IN GERMAN COLONIES.

There is, says the *Hamburger Börsen Halle*, no doubt as to the value of cotton culture to the owner, as evidenced by the grand results of Russia in Turkistan, which will soon render the Russian cotton market completely independent of other countries. These results have drawn the attention of the leading circles in Germany to this branch of colonial economy. The endeavours of the Economic Committee of the German Colonial Society, regarding the production of cotton, are not to be limited to Togo, but Eastern Africa is also to benefit by them. Already the existence of indigenous cotton at Kilimatinde, Tanga, Wilhelmsthal, Mandera, Kissorawe, Kilwa, Kilossa, Bismarckburg, a primitive cotton-weaving establishment of the Wahunga, at Kilimatinde, at Rungwe-Urungu, and on the shore of the Tanganyika, does away with the doubt of the possibility of producing cotton in East Africa. A tabulated statement by Dr. Hans Maurer shows that the climatic circumstances and the amounts of the yearly rainfalls do not vary essentially from the quantity of rainfall in the cotton-producing districts in the North America. The cotton enterprise in East Africa is to be placed at once on a broad basis by founding a teaching institution, and by the settlement of American cotton farmers. The managers are instructed to concert proper measures for procuring the necessary means, so as to secure the undertaking for at least two years. The Government of German East Africa, a number of cotton-spinning associations and industrialists, have already granted financial help to the undertaking. North-American negroes from the Normal and Industrial Institution at Tuskegee are to be engaged for East Africa.—London *Chamber of Commerce Journal*, October.

## THE INDIAN ACACIAS.

India can lay claim on only twenty species, which are distributed throughout the plains, two species reaching an altitude of 5,000 feet above sea-level. But of these twenty species, three are of considerable commercial importance, *viz.*, *A arabica*, *A catechu* and *A. senegal*; the remainder being more or less of ornamental character. A few foreign species have become completely naturalised in India, such a *A. dealbata*, the Australian Silver Wattle, and *A melanoxylon*, the Australian Black-wood. These latter are now found plentifully in the warm temperate tracts of India, especially in the Nilgiri Hills of South India, where they are introduced so far back as 1840. *A. concinna*: The first species noticed is a scandent bush met with all over India, the pods of which are used as a detergent and often confounded with the soap nut (*Sapindus mukorossi.*) The bark is used in tanning, but its chief commercial value lies in its pods, which are largely imported into Bombay from Kanara. The pods are also largely employed in washing silk and woollen goods, as the best tinctorial results are obtained when yarn is washed with these pods previous to dying. Tarnished silver-plate washed with these pods attains great brilliancy. *A. Farnesiana* yields the well known "Cassie Flower" of perfumers. "Cassie Pomade" made in India at one time had a great reputation. It was prepared by an Anglo-Indian Engineer of Naini Tal who used to send supplies of it to London. After his death the trade in Indian Cassie Pomade died out. Mr. Umney, of Layman and Umney, considered the produce from Cassie Flowers grown in India, superior to that grown in Grasse, in France. However, the possibilities of a trade in Cassie Flowers are present, for the tree abounds in India; but it wants some one with enterprise to develop it. *Jacquemontii* is another valuable shrub, distributed throughout India, up to an altitude of 3,000 feet. It bears sweet-scented flowers, and its chief product is a gum, which is recognised as one of the spurious gum arabics, which comes chiefly from Baluchistan and Sind. Messrs. Rowntree and Co., Ltd., of York, have pronounced the gum of this species as "the best of the series of Indian gums examined by them for the confectioners' requirements.' It is described as strongly mucilaginous and sweet in flavour. *A leucophlœa* is another Indian species of some economic value; it is found all over the Punjab Rajputana, Central and South India and Burma. Its presence is held to denote a rich soil. It yields a gum of some commercial value, the bark affords a strange fibre, and is used largely as an astringent in alcoholic distilation by natives, and is therefore called the 'Distiller's Acacia.' We next come to *A. modesta*, the well-known 'Phulai' of the Punjab plains. It yields a good gum classed by Bombay merchants as 'Amritsar Gum;' and a beautiful, strong, dura-able timber, largely used for agricultural implements. *A. pennata* is a climbing shrub, met with in the sub-Himalaya region, East Bengal, South India and Burma. Its bark is a commercial product used to tan fishing nets in Bombay. *A. senegal* met with chiefly in Rajputana and Sind yields the true Gum Arabic of European commerce, the *verek* of the Negroes, and comes chiefly from the French Colony of Senegal. A very full account is given in the *Ledger* before us of the produce of this tree, and its commercial value. *A. Arabica* is the tree which yields the true *Indian* gum arabic, found over the greater part of India, and known as the *Kikal* or *Babul* tree. There are several varieties of this species, or rather, we

should say, several forms of it. It is the most important of all the Indian Acacias from the economic point of view. *Acacia catechu* is the tree that yields the well-known "kutch" or "kath" of India. In addition, it yields a very good gum and a hard, durable timber.—*Indian Gardening and Planting*, Oct. 9.

## IRRIGATED COFFEE.

(To the Editor *Madras Mail.*)

Sir,—Will you kindly publish a recent experience of mine in regard to my Irrigation Coffee? I have a plot of four acres which has special facilities for irrigation during the hot months. A portion of my oldest trees (7 years) are planted there. They have given me four crops, including the present, and the last crop was 22 cwt out of these four acres. The plants did not suffer to any extent. On the contrary, they put on fine wood for this year, but I was rather disappointed with the existing crop,—I commenced picking in August—which I do not estimate at more than 7 or 8 cwt for the whole plot. To my very agreeable surprise, I find now that the plants are throwing out "spike," mostly in a "forward" condition, and in a fortnight or so I expect them to blossom; and this means that in May and June I shall have another crop, which, judging from the vigorous condition of the spike, must be rather abundant. One of the principal objections raised against coffee grown under irrigation is that the plants get no rest as in the Mulnaad, but the admirable condition of my plants, which *are giving* a fourth crop and *are preparing* for the fifth, shows that properly irrigated and well-manured, the plants take care of themselves, and take rest only when necessary.—C. MEENACSHAYA, Gowripuram.

## THE FIBRE INDUSTRY.

Sir,—Mr. V T Vencataram Iyer, of Valavanur' South Arcot, has done a great public service by publishing the results of his valuable experiment into the plantain-tree fibre, thereby drawing public attention to an industry which may prove a blessing to India where these trees are grown very largely, and he deserves the thanks of every well-wisher of India. Now that he has satisfied himself of the highly remunerative character of the fibre, I beg to make a suggestion to him, which, whilst conferring a great benefit upon the landlords who grow these fruit trees on a large scale in Southern India, may prove highly advantageous to himself. In Tanjore and Trichinopoly Districts, to my personal knowledge, these trees are grown largely. If he could practically instruct in person, or by an agent, some of these landlords, in the method of extracting the fibre, and arrange with them the sale to himself of the fibre, he could, while putting some money into their pockets for what hitherto had been a valueless article, gradually develop for himself an export trade, which might eventually grow into gigantic proportions. If there were many gentlemen amongst us who possess the same practical turn of mind as Mr. V. Iyer, such a suggestion would be needless, but our men are mere theorists carping, criticising and complaining, without any earnestness for making practical efforts.

Whilst on this subject, I take the liberty of suggesting another fibre of much greater value than plantain fibre, which could be extracted from pine-apple plants. These might be grown in a plantain-garden so that both these valuable products could be had out of the same plantation. A very interesting and instructive letter on pine-apple fibre was published in the *Madras Mail* of the 24th June, 1901, and if Mr. V. Iyer cannot readily lay hands on this letter, I shall be most happy to send it to him. The process of extracting that fibre, adopted in Japan and the Philippines, as I learnt from Dr. Watts, is likewise simple. C. MEENACSHAYA.
Gowripooram.
—*Madras Mail*, Oct. 27.

## COCONUT BEETLE IN THE STRAITS.

The following resolution was proposed by Mr. E V Cary and seconded by Mr. C R Meikle:—"That in view of the alarming spread of the coconut beetle pest the Government be asked to appoint a special European Inspector in each State, whose duty it shall be to see that the provisions of Enactment V. of 1898 are strictly enforced. "That, in the opinion of this Association, it is essential that all trees which have been badly attacked shall be deemed to be 'beyond recovery' and forthwith uprooted, split up and burned, unless the owner can satisfy the Inspector that such trees have been regularly attended to in the past and are at the time of inspection free of beetle. "That for a second offence no excuse shall be accepted by the Inspector. That the burying of uprooted trees should not under any circumstances be allowed, the Enactment being amended, if necessary, to provide against this. That the Inspector should pay special attention to the enforcement of section 6 of the Enactment with respect to the breeding places of beetles. That all other palms which are infested by the coconut beetle shall be deemed to be 'breeding places' within the meaning of the Enactment and dealt with accordingly." It was agreed to alter the draft resolution and to insert the word European before Inspector. The Chairman said he was in a position to state that the High Commissioner had interested himself in the matter and it was satisfactory to know that we had his sympathy. As regards the breeding places of the beetle he considered that all rubbish heaps, serdang, and sago trees where the beetles are known to breed should be treated as such, and that uprooted trees should on no account be buried. There seemed to be no complaint of beetle in either Negri Sembilan or Perak, and he thought that when the Enactment was properly carried out Selangor would also be free from them. Mr. Meikle said that he concurred entirely with what the Chairman had said, but if the matter was not taken in hand at once he was afraid that coconut cultivation would be impossible. He went over an estate a few days previously which was covered with dead serdang and other palms in which the beetle breeds, but the coconut trees showed no signs whatever of being attacked, proving that if the pest is taken in hand at once there need be no fear of the beetle attacks becoming dangerous.—*United Planters' Association F. M. S.*

## GRAVE CHARGE AGAINST A MANURE MERCHANT.

Mr. A J Forest, chemical merchant, carrying on business in Brussels, was charged at the Mansion House Police-court, yesterday with obtaining large sums of money under false pretences from Mr. Henry Hollingshurst, chemical merchant, of 127, Fenchurch-street, in connection with the purchase of quantities of basic slag used as a fertiliser or manure.—Mr. Cranstoun, barrister, who prosecuted, said that Mr. Hollingshurst had entered into contracts with the defendant for the purchase of hundreds of tons of basic

slag, the stipulation being that the slag should contain from 38 to 45 per cent. phosphate of lime. Cargoes which were sent over from Brussels were subsequently re-sold by the complainant to customers in Ireland. There was an arrangement between the complainant and the defendant, under the terms of which ·75 per cent. of the purchase money was to be paid on the analyst, by Dr. Dyer, a well-known analyst, of the sample of the cargo, and the balance on delivery. The allegations were that, whereas the samples submitted to Dr. Dyer contain the full proportion of phosphate of lime, on the faith of which the complainant made payment, the bulk of the cargo contained in some cases merely 7 to 8 per cent. of phosphate, and was practically useless, being, said counsel, little better than ground brick-dust. The customers of the prosecutor in Ireland were naturally furious when discovery was made with regard to the quality of the slag, and demanded back the money which they had paid, and in the result the prosecutor had necessarily sustained considerable monetary loss.—The prosecutor stated in evidence that he had paid the defendant in respect of slag over £1,900. Samples of cargoes showed a deficiency in one case of 20 per cent. phosphate of lime, and that it was quite unmerchantable. In round figures he was about £5,000 to the bad over the business. The case was adjourned, the defendant being admitted to bail.—*Globe*, Sept. 27.

## COFFEE PLANTING IN SOUTHERN INDIA.

Nelliampatty Hills, Palghal, P.O. S.I.

You will probably be surprised to hear from me and will perhaps not remember me even when you see my name. I left the College in the spring of '94, and came out to India shortly after. As I believe a good many fellows go to India from the College, perhaps some of my remarks may be of use, and I shall certainly be very glad if they are. . . .

I have been coffee-planting ever since I came out, and am not doing altogether badly as things go, but from want of capital have not been able to do as much as I should have liked. No fellow ought to come out here with anything under £1,800 if he wants to do anything in coffee, as superintendents' billets are hard to get, and there are already plenty of men in the country ready to jump at any place there is going. The best way for a fellow who has a little money, is to get a share in a young estate, not all opened, and try to get the superintendence or management of that. It is a mistake to put in money where there is much old coffee, as with prices in their present high condition not many men are inclined to part with it (unless there is something pretty far wrong).

The life of a coffee-planter is, generally speaking, very interesting and jolly, but of course not all beer and skittles; plenty of hard work, both in the field and in the office, and many fellows have to give up on account of fever, which is to be found in all coffee districts with very few (if any) exceptions.

As to kit, a fellow can bring out his ordinary English clothes and not go wrong, and it should be remembered that a few things can be obtained in India. Clothes can be copied splendidly by native tailors if good patterns are brought out, and it is a mistake for a fellow to buy a huge kit "expressly made for India," the greater part of which he will probably find useless to him. I speak from my own experience. If a fellow intends going in for shikar or big game, he cannot do better than the following battery if he has money to dispose of: *i.e.*, one double-barrelled 8-bore for all thick-skinned beasts like elephants, bison, etc., one double-barrelled 450 express and one double 12 bore shot and ball gun. That is the most serviceable battery that can be had. I speak from my own experience there too, having had some with every variety of game there is in Southern India. If a man has only a moderate amount of money to expend on guns, he will find a 12-bore paradox the most useful. . . .

—*Empire Review*, Oct. A. G. M.

## COFFEE IN BRAZIL

A telegram to *O Paiz* from Miraccma states that the drought has ruined the coming coffee crop in the State of Rio, that had providentially escaped the frost and that great misery prevails. Since then it has been raining hard for several days, so we suppose telegrams will be received to the effect that the little flower left from the frost and drought has been finally washed away by the floods and that there will be no crop at all. Then, we suppose, everyone would be starving but happy.—*B. Review*, Oct. 1.

## RUBBER: A GOOD STORY.

He is a bold man who attempts to predict the price of rubber a few weeks ahead. A friend of ours, some eight weeks ago, offered to bet a new hat that the price of "Para" would go up to 3s. 6d. before the end of November. We like to bet on certainties, and as this was not one, we did not accept his kind offer. He followed his opinions in good time and bought largely for his firm. May we be pardoned for saying that he is one of the few rubber men at the present time going about with an obvious smile and a whole-hearted contentedness delightful to witness. At the time of writing the price is still below his prophesy but he has still ten weeks or so to run. Let us hope he will still be chuckling at the end of that period. Some funny stories are told of how forecasts of the rubber markets are arrived at. We don't mean by this that the arduous study of its rise and fall is treated by any of the buyers with levity, but still on a matter which ofttimes defies the most careful calculations outside influences sometimes creep in. Perhaps the yarn is not new to some of our readers, but to most it will be. A buyer of rubber had wearied his brains out one evening late in December of 1901 in his attempt to come to a decision as to his purchase next day. He could not afford to let the matter stand over until the next sale. He went to bed late and for a while he could not sleep. When he did fall over he dreamed that he went into a shop where they sold rubber done up in packets like tea. He asked the shopman (who by the way resembled one of our best known brokers) for a pound and when he got it he laid down three shillings and one sixpence. Before the shopman could handle the money the sixpence went a missing mysteriously. After hunting for a time the shopman gave it up

with the words "It's lost for ever." When the buyer awoke next morning the yarn goes on to say that he remembered the dream so vividly that he could not bring himself to buy at the sale—the price being then just about 3s 6d, with an apparently rising market. The poiut of the story lies in the fact that within a fortnight the price had gone down to 3s 3d and within the month it had sunk to 3s. So if he *had* bought before his sixpence would have been "lost for ever." Such a dream may be merely a coincidence, but when it occurs it is apt to puzzle the man to accouut for it. The buyer in question has, we believe, never been visited again by such a truthful dream, nor had the subject of rubber even ever been prominent during his fleet before, nor has it been since. Any of the gentlemen engaged in the same occupation who have experienced similar "portents" are invited to let us hear them.—*India-rubber Trades' Journal*, Sept. 15,

## SNAKE BITES AND THEIR REMEDY.

Now that anti venene is generally employed as a remedy for snake-bite in India, it may interest the public to know something of its methods of application. It should be premised that the effect of snake-bite depends on (1) the quanity of venom injected in relation to the weight of the human being or animal bitten; (2) whether the venom is injected into a blood vessel or into the tissues. If the fangs of the snake penetrated a blood-vessel and a sufficient amount of venom is injected into the circulation direct, the person or animal is doomed. In such a case there would be no time to use anti-venene or any other remedy, and death might take place in ten or fifteen minutes. Luckily cases of this kind are quite the exception. On the other hand, when the snake injects the venom into the tissues death does not occur for hours, and frequently no symptoms set in for hours, also. It is in these instances that anti-venene can be effectively employed. It has been demonstrated that the amount of venom which kills an animal of certain weight when given intra-venously takes from two to three hours to kill a similar animal of the same weight when given subcutaneously. The average time in which death takes place after cobra-bite is about eleven hours. The extremes vary from half-an-hour to twenty four hours; so in the great majority of cobra cases there is ample time to use the remedy. When the patient is seen in good time, and before the symptoms have become advanced, the treatment is by subcutaneous injection; if the dangerous stage seems to have been reached, it is best to inject direct into a vein. When given intra-venously, this antidote acts very quickly and patients can be saved at a stage of the poisoning when it is not possible to save them by the ordinary subcutaneous method. Anti-venene is now being prepared at the Pasteur Institute, Kasauli, and India should soon ceases to be independent of Calmette's laboratory at Lille, whence it has mostly been obtained. While on this subject we may refer to some recent statements regarding bites from mad dogs or jackals, and the application of turpentine, ammonia, etc., to the wounds. Pure carbolic acid, phenyle, or the actual cautery are probably the best forms of local treatment. Other caustics and turpentine are also beneficial; but no form of local application can be thoroughly relied upon to prevent the subsequent onset of hydrophobia, unless the wounds are very superficial and the caustic is immediately and most thoroughly applied. Cauterisation destroys some of the poison which the rabid animal implants in the wound, when the application is made within a few hours of the bite—some authorities even say up to twenty-four hours; but after twenty-four hours it is certainly useless. It is questionable whether it does any good after ten hours. In every case it is desirable to use cauterisation of some kind as early as possible; and if no application is available, the wound can always be thoroughly washed with water. The object aimed it is to get rid of as much of the poison from the wound as possible, either by applying caustic or by washing it out. By this means the incubation period is prolonged and time is gained for successful treatment at a Pasteur Institute.—*Pioneer*, Oct. 29.

## AN AUXILIARY PRODUCT TO TEA.

(To the Editor of the *H. & C. Mail.*)

Sir,—At the last annual meeting of the Indian Tea Association I was glad to notice that Mr Robert Hart, who had for many years practical experience of tea planting and enjoys the reputation of being an authority on all that concerns tea, advised the planting out of an auxiliary product to tea, such as sisal fibre, grown from the "Sisalana Agave," and, better still, that he has the courage of his convictions, as I learn from good authority he has arranged for the necessary seedlings to plant out between six and seven hundred acres during the next three years.

This would serve as aid to the profitable working of tea concerns, not only by being in itself a valuable commercial product, but also by covering the cost of the obligatory employment of the whole labour force during the slackest part of the year, that is to say, the complete labour force in a garden is only required eight or nine months of the year, whilst the rest of the months a good half of the coolies are given employment in Sylhet, more with a view to their receiving living wages than for any direct benefit.

In planting out sisal on land belonging to a tea garden, the initial cost of the plants, and in three or for years' time the purchase of a fibre-extracting machine, would be the only items of prominent expenditure. The cost of planting should be small, as putting out from 700 to 1,000 plants per acre is all that is necessary. There would be the existing establishments, both European and native, engine and boiler, buildings, labour force, &c., to be further employed and used in the production of the fibre; the only direct chargeable items would be the actual pay of the coolies employed in planting out and upkeep of the plants. Besides the above advantages, land unsuitable for tea would be made productive under sisal. Belonging to most, if not all, tea estates such land is to be found. Also those parts of a garden planted with tea giving little, if any, remunerative results, would grow sisal to advantage. The benefits of planting out sisal as an aid to the prosperity of tea concerns should be great. The demand for fibre, such as the "Sisalana Agave" produces, according to all information obtained from reliable sources, promises well for some years to come, and even if with the natural increase of production, prices should fall, India, with its cheap labour, will always hold its own, certainly with all those countries which now produce it. R. Wood.

—*H. & C. Mail*, Oct. 10.

## THE PEARLING INDUSTRY.

A most interesting report on the pearling industry by Mr. Justice Dashwood, the Government Resident of the North Territory, has been forwarded to the Acting Premier of the Commonwealth. In 1901 the pearl shell raised in the Torres Straits fisheries was valued at £105,403. The indnstry is carried on by coloured labour, white men being nnable to stand the trying character of the life. The industry, it is said, will be practically killed by the White Australia policy.—*Commercial Intelligence*, Oct. 9.

## CEYLON GAME PRESERVATION SOCIETY.

### AND NILGIRI HARES.

Some time ago, the Nilgiri Game and Fish Preservation Association received a letter from the Fish and Game Preservation Association of Ceylon, asking that the Association might forward them fifty Nilgiri hares. The Association was then of opinion that there were not sufficient on the hills. They are now so plentiful and so great a nuisance to the native market gardeners that these men are everywhere seen, asking sportsmen to hunt them. I know a sportsman, says an Ooty correspondent, who has secured on putta land on an average two hares every time he was out, while the *Asian's* mighty porcupine-slayer, who has, the blessings of all Badaga cultivators, has, without the aid of firearms, accounted for no less than 55 porcupine, for the flesh of which he has constant applications. The greatest enemy of the hare is the jackal, and it is a pretty sight to see some three or four of these animals surrounding a hare and covering it down—especially on a moonlight night. Jackals are just now very plentiful in the nights near the Hobart Park, and are playing mischief with domestic poultry. Under the circumstances the Association might well give the Ceylon Association 500 not 50 hares.—*Indian Daily News*, Nov. 5.

## QUININE AND ITS HISTORY.

The Cinchona trees were chiefly to be fonnd upon the Eastern slopes of the Andes, and until the discovery of quinine the Peruvian bark of commerce was drawn in the main from this district, the finest qnality, grown in the town of Loxa, and known as Crown Bark, being long reserved for the Royal Family of Spain. Of conrse, the demands of Europe soon denuded the native forests of their trees, and led to the cultivation of Cinchona in other districts. The Dutch were the first to make the experiment of cultivating the plant in Java, where they met with mnch snccess, their example being followed by the Indian Government and by English residents in the East, with the result that for many years past there have been extensive plantations in the Neilgherry Hills, British Sikkim, Bombay, and British Burmah, while the growers of Ceylon have extensively planted it in Colombo.*—W. N. Broun in *Journal of Horticultural*, Oct. 23.

* Not within 100 miles of Colombo which is by the seashore, but on the hills from 3,000 to 6,000 feet above sea-level.—Ed, *T.A*,

## PASTURE:—GOOD INTEREST.

Mr. Alfred Tucker, secretary of the Totnes Union Chamber of Agricultnre, writes to the *Western Morning News*:—In November last I applied on an eighth of an acre of pasture land after the rate of four hundredweight of kainit and two hundredweight superphosphate an acre, and in the first week in April one hundred weight of nitrate of soda. The grass adjoining was unmanured. The grass was cut the middle of July and the hay carefully weighed, with the following results:—No manure, 27 cwt an acre; complete manure, 55 cwt an acre. I may add that the experiment was made on an old pasture field in good heart on clay and shale subsoil. —*Liverpool Echo*, 18th Aug. 1902.

## ROCK SALT FOR STOCK.

Allow me through your paper to call the serious attention of all farmers, during this sadly wet and critical harvest, to the great importance of allowing all sheep and horned stock access constantly to as much rock salt as they will take, as well as a daily allowance of dry food. In the disastrous years of 1879 80, when I was farming largely for the late Duke of Bedford, I fully believe that many flocks of sheep that then perished with fluke and other liver rot would have been saved if these simple directions had been attended to.—H S Fenning in *Agricultural Gazette*. [Applicable to certain districts in Ceylon?—Ed. *T.A.*]

## THE ORIGIN OF PEARLS.

From early classic times the question of how pearls were formed has been discussed, and various theories have been pnt forward to account for the occurrence of these gems in oysters and other molluscs. The identity of the material from which they are built up with that of the shell-substance has long been recognised, and among the causes suggested for their production may be ennmerated concretions from the shell-forming fluid, perforation of, on other injury to, the shell, an aborted or displaced egg or a grain of sand, acting as a nucleus round which the shell-forming fluid accumulates, and, the action of a parasite, supposed to produce in the mollusc a result analogous to that caused in plants by the puncture of a gall-insect. Among those who have tried to produce pearls by artificial means, the most famous is Linnæus, who received from the Swedish Diet a reward of about £500 for his supposed discovery, which, however, turned out to be valueless. Nevertheless, it was, when first announced, rated so highly that it has been pnt forward by some writers as the reason why the great naturalist received the patent of nobility which is generally supposed to have been the reward for his services to Science. Dr H L Jameson, who has lately re-arranged the collection of pearl-bearing oysters in the British Museum (Natural History) has devoted a good deal of time and labour to the investigation of this matter and the results arrived at by him have just been published in the Proceedings of the Zoological Society. He has come to the conclusion that true pearls, which are fonnd in the flesh snbstance of the oyster or mussel, are entirely due to the presence of a parasite. What he call 'blisters,' or secretions of pearly matter attached to the interior of the shell are produced by the deposit of nacre or mother-of-pearl, in order to close an aperture, arising from injury, or to coat some irritating foreign substance introduced between the animal and its shell. Good examples of 'blisters' may be seen in the Natnral History Museum in the small metal images of Buddha, inserted by the Chinese in the shell of a pearl-bearing, and coated with mother-of-pearl, and the same collection contains small fish and crabs similarly coated.

As Dr Jameson was unable to go again to the Southern Hemisphere (from which he had recently returned) to study the true pearl-oysters, he began his observations at Billers, in Morbihan, where there is a small, but somewhat noted, bed of pearl-bearing mussels. He was soon able to trace the formation of pearls in these molluscs to the larval form of a worm closely allied to the fiver-fluke which infests sheep. The parasite which has been found on the inner surface of the shell make i's way into the flesh substance of the mussel, and then curls up and passes into a resting stage. Pound it there is developed by the mussel a number of cells clining its resting-place, and these cells coalesce to form the pearl-sac in which the intruder is enveloped. In the ordinary course of events the larval worm becomes calcified in its prison, from the outer wall of which the pearl-substance is deposited layer on layer, and the growth of the pearl probably goes on at the same rate as the thickening of the shell. Dr Jameson has found that the larva may leave the sac, migrate in some other part of the body of its host, and there again settle down. This is evidenced by the fact that empty sacs have been met with in the body of the mussel. He was also successful in working out the life-history of the parasite, which, at Billiers, migrates into the mussel from the tapestry shell, and at Piel, on the Lancashire coast, from the common cockle, these being in each case its first dwelling. The perfect stage, in which reproduction takes place, seems to be passed, at least at Morbihan, in the black scoter, one of the diving ducks widely distributed in the Northern Hemisphere, in which adult forms were discovered. The eggs expelled by the duck are probably carried into the tapestry shell, and there hatched ont, the larvæ being carried out by the water to find their way into the mussels. At the Fish Hatchery at Piel, and at the Brighton Aquarium, Dr. Jameson succeeded in artificially infesting mussels with these parasites and in producing small pearls. He is of opinion that the study of the parasites infesting the pearl-bearing oyster will throw light on the question of the artificial production of pearls. The life-history will probably correspond to that of the parasite infesting the pearl-bearing mussel. The first host will, no doubt, be some other mollusic found on the pearling-grounds, and the perfect stage will be reached in some of the file-fishes which feed on the pearl-oyster. Dr Jameson suggest that when these questions have been solved young pearl-oysters should be laid down in beds easily accessible, and with them the molluscs in which the parasite passes the first stages of its existence. In this way he thinks his investigations may be turned to economic account by inducing in the pearl-oyster the pathological condition which, as he has demonstrated, gives rise to pearls in the common mussel.—*Standard*, Aug. 28

## THE PLANTAIN FIBRE INDUSTRY.

A good deal has been said and written of late years on the possibility of creating a plantain fibre industry in India, and it is interesting therefore to have the testimony of an intelligent Hindu landholder who has tried it. Mr V T Vencataraman Aiyar, of Valavanur, South Arcot, has placed at our disposal some practical notes on the subject which we cannot help thinking very valuable and instructive. In his experiments he has used the discarded stalks and sheaths of the common plantain, which are usually thrown away or burned after the fruit has been plucked. Samples of fibre extracted by him from these were sent three months ago to Messrs. Ide and Christie, the chief fibre-brokers of London, who valued them at prices ranging from £35 to £25 per ton. The following extract from Mr Venkataraman Aiyar's notes is particularly interesting:—

My experiments, the results whereof are more or less in accord with those reported to have been obtained in Kew Gardens, Jamaica, etc., show that an average plantain stem cut for fruit would give about 1¾ lb of the clean, lustrous, long stapled and commercially valuable fibre; and an adult with a week's experience can work about 8 stems a day, a boy being given to assist him in tearing the sheaths into longitudinal pieces of ¼ inch width and in collecting the broken fibre and in drying, then and there in the sun, the fibres extracted. The adult's wages being put down at 4 as. and the boy's at 1½ as. a day, we get 14 lb of fibre for 5½ as. (In other countries where plantain fibre industry is usually carried on, they get, it is said, over 2 lb a stem, but this I think is due to the dexterous experience in extracting the fibre with the help of "the cheap simple but effective contrivance"; and here too, after some experience I think the same results, if not more, can be had.) Even taking the outturn as per my experiment, and granting that special men are to be engaged for fibre-extracting work, the charges for extracting 1 ton of fibre from plantain stems as they are cut for fruits, amounts to R55 a ton; to this add R35 (this has been ascertained) for freight, traders' commission, insurance, etc., charges, and charges for bundling and pressing the fibre in bales, the total comes to R90. Even adding R10 to cover any extras, the charges to an agriculturist up to the stage of placing the fibres in the London market is R100. From Messrs Ide and Christie's quotations above given, even taking the value at only the lowest price, *viz.*, £25 a ton, there is a net profit of 25 × 15 or R375—R100, or R275 for a ton of fibre. On an acre of plantain in these parts are grown about 1,200 stems; so the outturn per acre will be about a ton. Even taking this at only ½ a ton per acre, there is a clear additional income of R140 an acre; and as this means conversion into money of fruit-cut stems thrown away to rot on the ground, I venture to say it is opening a new source of agricultural wealth.

As regards the process of manufacture Mr Vencataraman Aiyar says:—

The cheap contrivance in use in the Philppine Islands is said to be the cheapest and most effective method yet invented. It consists of a small wooden plank and fixed to it is a blunt iron knife weighted with a lever under which the longitudinal strips of the plantain sheaths are drawn; this drawing process repeated twice or thrice separates the stalk and the juice from the sheaths and there remains in the hands of the operator a beautifully clean, long and lustrous fibre. This cheap contrivance can be made by a common blacksmith, locally for about a couple of rupees. I had one made to enable me to extract fibre for purposes of experiment.

At the same time, Mr Vencataraman Aiyar points out, that it is no use trying to start the industry on an acre or two of plants. The cost of extracting, cleaning, baling and transporting small quantities would be prohibitive, and he concludes that the only business-like plan is to plant considerable areas and to set up factories capable of dealing with the fibre in merchantable quantities. He himself wanted to buy from Government some 400 acres of waste land near his own village for the purpose; but the land has since been auctioned to a number of persons, and he has been unable to carry out his purpose.—*M. Mail*, Oct. 21.

THE SILKY OAK—attains a height of 70 to 80 feet. The colour is a light grey, beautifully crossed with silvery waves, and when polished the surface has a delicate lustre. Bedroom suites made from this wood possess a dainty appearance.—*Commercial Intelligence*, Oct. 23. [This is the *Grevillea* so common in our planting districts: has any one in Ceylon utilised the timber for cabinet work and with what result?—ED, *T.A.*]

## CACAO IN ST. LUCIA.

Mr Geo. S Hudson, the Agricultural Instructor, contributes the following interesting notes on cacao cultivation in St. Lucia:—The cacao crop promises fairly well. The first main crop pickings have already commenced, but the crop is a peculiar one. We have a small quantity of large ripening pods, and then an almost complete break in the crop, of a month or six weeks (corresponding with the very wet season experienced from May 24 to July 6), and then a large quantity of small pods, from July and August flowers, which will ripen mainly in December and January next. On the whole the crop promises somewhat better than it did this time last year.

### MANURING CACAO.

At the September monthly meeting of the Soufrière Agricultural Society a useful paper was read by Mr Wm. M Smith, manager of Union Vale estate, on this subject, which it was decided to publish together with some notes by the writer on 'Artificial Manures for Cacao.' The concrete points argued in these papers are:—

1. That stable or pen manure is best preserved (for about three months) in a covered pit 4 feet deep, with a good layer of straw at the bottom to absorb moisture, and alternate layers of manure, straw and dry earth, watered daily with urine and stable washings collected in a receptacle from stables floored with concrete.
2. That such manure should be applied broadcast over the whole surface of adult plantations and lightly forked in.
3. That artificial manures have in many cases proved more efficacious and cheaper than natural manure.
4. That basic slag at the rate of 5 to 10 cwt. per acre, applied in December or January, followed by 1 cwt. of sulphate of ammonia the following August or September has given the best results in St. Lucia and also Grenada, on the experiment plots worked by the Imperial Department of Agriculture. The cost of such applications would be from £2 10s to £5 per acre. The results in increased crops have justified the expenditure several times over.
5. Nitrate of soda, 1 cwt. per acre, is clearly indicated in the attacks of *Diplodia* and other diseases where the foliage is first affected.
6. Bone meal, about ½ lb to each hole, is the most satisfactory application when young plants are being put out.—*Agricultural News*, Oct. 11.

## LIMES IN GRENADA.

The Grenada *Federalist* reports that at the recent meeting of the managing Committee of the Agricultural Society, the question of planting the Spout land in limes took place. 'It was urged that the lime industry was likely to prove a valuable assistant to cacao and spices, and that an object lesson was necessary to enable peasant proprietors to have some idea of the method of cultivation and a knowledge of the value of the product. Lime fruit had been recently selling locally for export, at very good prices which were more remunerative than anything that cacao could bring, and it was urged that the systematic cultivation of this plant, would, therefore, be of very great benefit to the community. A vote was agreed to for cultivating one acre of the Spout lands in limes.'—*Agricultural News*, Oct. 11.

## COCONUT BEETLES.

The following letter from the Inspector of Coconut Trees, to the Chairman of the United Planters' Association is interesting,

Sir,—I have the honour to inform you that the Government, through this office are taking immediate steps to see that the provisions under Enactment IV of 1898 for the preservation of Coconut Trees, is properly enforced.

2. The staff which I hope shortly to have at my disposal will I believe prove sufficient to carry out the necessary measures for this purpose, and I trust that before long the disastrous effects caused by the present ravages of beetles may be minimised as much as possible.

3. It must, however, especially in certain localities where the trees are seriously infected, take some considerable time before any really satisfactory improvement in many of the plantations can be looked for: meantime, I would ask your Association kindly to co-operate with me in the work and assist me in making the best progress possible.

4. In many of the coconut plantations, and this applies more particularly to native holdings where the ravages of beetles are worst, it will I fear be necessary to take very stringent measures, but I would prefer using most pressure by persuasive means, pointing out to owners and tenants alike how much it is to their own advantage, if they will themselves help in getting rid of these pests.

5. With regard to this a great deal of good can be done by their keeping their plantations clean and allowing no rubbish heaps, rotten stumps, or mounds of manure to accumulate, everything as far as possible should be burnt.

6. Your Association may therefore be able to afford me valuable assistance by using their influence with owners of plantations to take these ordinary precautions as far as it lies in their power.

7. I am aware that it may happen that any owner or occupier may be considerably hampered from keeping their plantation's free from beetles owing to the trees in their immediate neighbourhood being neglected, and if this is so and reported to me I shall at once take measures to have this remedied.

8. In conclusion, I have only to add that I shall appreciate any information on the subject which your Association may be able to give me, and any suggestion that may be made will receive my best consideration.—I have the honour to be, Sir, Yours, etc., Inspector of Coconut Trees. F.M.S.—*Perak Pioneer*, Oct. 25.

## MALTA'S NEW INDUSTRY VINES.

Baron Ugo Testaferrata, a member of the old Maltese nobility has established a new industry in Malta. After ten years' planting and experimenting he has proved that the vine can flourish on Maltese soil, and is now able to produce 10,000 gallons annually of excellent wine, with an alcoholic strength of 15 per cent., and maintaining an unaltered standard from vintage to vintage. This wine is in growing demand both in London and New York, and has been awarded a silver medal at an international wine exhibition at Turin.—*Daily Mail*, Oct. 27.

## RUBBER COMBINE.

New York, Friday.—*Commercial Advertiser* this morning says that the United States Rubber Company, acting with Sir Martin Conway, of London, is forming a large combine to control the Bolivian supply of rubber, King Leopold of Belgium, it is stated, is a stock-holder in the concern. It is estimated that the new company will produce twelve million pounds of rubber annually.—*Central News*.

## BEAR SHOOTING IN CEYLON.

Though not frequently met with, bears are by far the comomonest of the "dangerous" animals of Ceylon. It is owing chiefly to their nocturnal habits, and the fact that they frequent the driest, rockiest and most difficult country, that sportsmen comparatively seldom get a shot at them; whilst natives hold the very name "walaha" in such dread that even the reward offered by Government for their destruction does not often tempt them to molest the savage brutes.

For a certain friend of mine, however, they held a special fascination. G made bear shooting a regular pursuit, and though most reticent as to his fields of operation, used to whet my ready appetite with such alluring descriptions of various trips he had made, that I arrived at a pitch of keeness which seemed to touch him in a soft spot, and one day he promised to show me a famous locality for bears if I would accompany him and vow to keep the place dark. A second invitation was unnecessary—I fairly leapt at the idea. We talked it over far into the night, and before the sound of G.'s ricksha wheels had ceased to grate on the drive, I was making a list of my requirements, and consulting a map of the Uva Province, wherein lay our chosen district. The next day was spent in getting together a few necessaries, and on the following morning we started early, taking one attendant each and my cook Peter, who was invaluable whether at home or in camp, his only drawback being a marked upward tendency of the elbow, which periodically got him into trouble.

We shipped on a little British India coasting steamer, which ran round the island once a week, and were landed at Hambantotte late in the evening. Here we stayed the night, and early next morning two bullock carts were chartered, one for us and one for provisions, luggage, &c., and Peter was instructed to procure some fresh food in the shape of fowls and rice. The unwonted ease of his existence was too much for him, however, and he had been putting in all his spare moments getting hilariously drunk. Consequently when we were ready to start, Peter was conspicuous by his absence. After much searching we found him, chasing the fowls he had bought up and down a street, and stuffing them back one by one into the crate from which they had escaped. No sooner had he got them all back than he (at sight of us) dropped the bag of rice and spilt half its contents. During the flustered operation of gathering it up more fowls escaped, and, with a ready eye to the main chance, helped to pick up the rice. There was no time to chide the erring Peter, and eventually, amidst the creaking of cumbersome carts, the shouts and strange urgings of their drivers, and the screams of turbulent poultry, we made a start with as much dignity as our surroundings would allow.

We followed the road through the salt lakes, crossed the Mahagam river, and came to the banks of the Manik Ganga (Jewel River), the sandy bed of which is composed almost entirely of quartz, sapphires, and rubies. Whilst quite valueless, the effect is most Aladdin-like, the water magnifying the tiny particles into sparkling gems of enormous size. Following the river for some distance, we forded across, and, after fighting our way through creeper-covered tracks for another two hours, camped in about the worst bit of country I had ever seen. It was simply a tangle of dry jungle, interspersed with small ravines, choked with boulders, and low, rocky hills, seared and jagged on all sides by fissures and gaping cracks. There was just time to run up a hut of jungle sticks and "talipot" mats before the sun set, and, after a dip in an adjacent pool, a good square meal, and a cheroot, we turned in and dreamt exaggerated dreams of what sport the morrow would bring.

Two hours before sunrise we were sipping tea and munching a biscuit, and G then led the way to a corner of his happy hunting ground, where it was likely that we should get a shot at some bear returning to his cave amongst the rocks above. Sending my boy Gregoris to a point of vantage, with instructions to whistle softly should he see anything, we took up our positions one on each side of a junction of two ravines, and waited. Fully half an hour passed and there was no sign from Gregoris, but suddenly I was startled by a shot from G, followed by the most human-like wails; and before I knew what had happened, a bear rushed into sight and was gone again without giving me a chance to draw a bead on him. G came tumbling down in his tracks, and we followed headlong in the direction the wounded animal had taken. We could just discern occasional spots of blood on the hard ground, and pressing on we came to a standstill at a small-mouthed cave in front of which were unmistakable signs that a family of bears lived within. It was quite light, though the sun had not yet risen, and again we hid among the broken rocks and waited in positions commanding the mouth of the cave. Scarcely had I recovered breath before I saw the ungainly, semi-comical figure of a young bear ambling along, stopping now and again to pounce upon some insect and, unconscious of danger, coming straight towards us. My excitement was intense, and I watched his movements with deep interest, wondering whether G could also see him, till suddenly he stopped and, protruding his loose, mobile lips, stood up and sniffed suspiciously. With my rifle resting on a rock, I took a quick but deliberate aim at the light mark on his chest, and pressed the trigger. It was a happy moment, and I tingled all over to see him collapse at the shot and drop dead without a sound.

We returned to camp and had a bath and breakfast, after which we prepared to bolt the other inmates of the cave, hoping to find G.'s animal and finish him off. Peter who loved to be thought a bit of a shikari, was deputed to carry my spare rifle and the crackers, and on arriving at the spot we made a careful survey, finding as we had expected another entrance to the cave about 15 yards from the first. Talking our loudest, we lit a candle and peered into the large entrance, and saw dimly that there were several deep holes in which the brutes were probably lying, listening to every sound we made. We directed the two boys to jabber their loudest and walk away. After their voices had died down, we left Peter at the large entrance and crept round to the other. At a sign from G Peter then lit one of the crackers and threw it in. There was a muffled report followed by the most infernal chorus of coughing barks, and to our consternation, out rushed a bear, not from the entrance we commanded but the one near which Peter stood. With a yell that would have wakened the Seven Sleepers, he dropped everything and ran like a rabbit, followed by the bear, which I at once noticed was going lame. We could not shoot as Peter, in dodging among the rocks, constantly crossed the line of fire. We went after him, but

could hardly run for laughter at the wretched Peter who was shedding portions of his raiment as he fled. G who was a little in advance to the right, at last got a chance and took a snapshot. The bear gave a roar and bolted up a stony gap on the left. I clambered up in hopes of cutting him off, and found myself face to face with the beast who was doubling back. He looked like charging, and I took a hasty shot, which sent him flying amongst a shower of loose stones. I shouted to G., thinking he was finished off, but not a bit of it. A moment later there was another shot and a loud "Hooroo!" The beast was at last dead, wedged in between two boulders between which he had fallen. He was the same animal G, had wounded in the morning, and was a a large male, with a coarse, mangy coat covered with thicks. He must have been lying somewhere round the corner when Peter threw in his cracker the result of which was to bolt him out of the wrong door. Whether the rest of the family had left the cave we had not had time to see, and decided to revisit it at nightfall and lie in wait for them, whichever way they went. On getting back we found Peter with eyes protruding and teeth chattering. His fright had reduced him to a jibbering idiot for the time being, and every sentence he muttered held the word "walaha."

We spent the rest of the day exploring the immediate locality and found several caves, the dusty floors of which bore the clubfooted marks of bears. All these retreats had more than one entrance and deep pockets or fissures in which the brutes lay in security and darkness. That evening G. with a fine long shot dropped a female bear dead as she came shuffling out of her den, and I succeeded in missing one of the easiest of shots and scaring, not only the animal at which I fired, but two others of whose presence we were hitherto unaware. In giving chase G. stepped on a ticpolonga snake, which writhed round his foot and bit at the tough leather of his boot and gaiter before it was shaken off and killed. The occurrence had a decidedly damping effect, and G., with a face as white as his topi, sat down and thought for five minutes, then drained off his flask of brandy, and suggested curried fowl for dinner. Peter, whose culinary resources were unlimited, quite surpassed himself that night and gave us an excellent five-course dinner, the original materials for which were, as far as I can remember, tough chicken, tinned beef, jam and rice. G. soon forgot about the polonga, and was hardly visible through the smoke of his cheroot as he sketched our plans for the next day.

Unless there is any incident to distinguish it, the description of one day's bear shooting is so like another that it will suffice to say that we accounted for seven animals and a porcupine, which I killed with a shot gun, and which we ate, finding the meat excellent. We worked our way back slowly, coming across several good patches of snipe ground on the way. We also saw a great many peafowl on the borders of the coast forests, but, being the close season, we had to be content with seeing them. In one of the villages at which our bullocks were changed we saw a man whose face had, years before, been half bitten away by a bear. He was an awful-looking object, but for us, fresh from the haunts of these vicious brutes, he had a peculiar, if morbid, fascination. Peter, in view of a certain recollection, refused to look at him.

—*Field*, Sept. 6. Tom-tit.

## WHERE GREEN TEA IS GROWN (? MADE.)

A Rangoon paper says that green tea is largely grown in Hsipaw and Taung Peng in the Northern Shan States, and now that the railway is extended to the former station, a considerable quantity will doubtless find its way to Burma. The last Administration Report says the new season has opened with brighter prospects; that prices have risen and the old stocks in Taung Peng have been absorbed. The greater part of this tea crop is used for pickled tea, an article to be found in every Burmese house and largely used by Burmese at every ceremony or in invitation to such ceremonies. But the manufacture of dry tea is increasing. It was noticed in many places last year where it had not been seen before, and it is believed some was taken on to Mandalay. The amount of pickled tea sent into Burma from the Shan States last year by rail was valued at over eight lakhs, and dry tea valued at three lakhs was sent during the same period. There is also a considerable amount carried by carts and pack animals in the dry season.—*Indian Daily News*, Oct. 8.

## PEARL OYSTER INVESTIGATIONS IN CEYLON.

It is understood that the investigations at the Marine Laboratory, Galle, by Mr. James Hornell have resulted in the settlement of several problems that awaited solution and is very confident of successful fisheries, if Professor Herdman's recommendations to Government were carried out. Our contemporary says that Mr. Hornell has received authority to bring a cargo of young oysters to Galle, to be placed in the shallow water at the foot of the ramparts with a view to practically testing whether a transplantation of oysters on a large scale to Galle would be a useful measure. Mr. Hornell was to leave for Trincomalee by the ss. "Lady Havelock" last month to make another survey of the harbour there and of Lake Tamblegam, coming back in time to join Capt. Legge for the inspection of the pearl banks next month.

## TEA AT PESHAWAR:

## GOOD DEMAND FOR GREEN TEA.

We are indebted to the Rev. J Gelson Gregson (who writing on 4th October, had just completed a tour of 6,300 miles touching Cashmere, Peshawar, Simla &c.) for the following interesting information, to which we attract the attention of our planters:—

"It may interest you to hear something about the tea trade in Peshawar, a station I visited last month—and while there was taken through the City and was surprised to see a great many *tea shops*, where cups of tea are sold all day long. The Afghans and Pathans are great tea drinkers, so the *tea shops* were as numerous in *Peshawar* as *whisky shops* are in *Glasgow*. I could not help thinking that this would be an opening worth cultivating for Ceylon tea, especially when I tell you that a very large trade is done with China. I was very hospitably entertained by one of the largest native merchants in the

City, and he gave me very excellent China tea, out of beautiful China tea cups *from Russia*—he showed me the cases of China tea, and said that Afghans always drink *green China Tea*—his trade is not confined to Peshawar, but extends beyond the frontier to *Cabul* and other places and on the other side of the frontier.

"Here is an opening for good *green tea* and *Ceylon* ought to compete advantageously with *China*."

## A BIG PARA RUBBER CROP.

According to the United States Consul at Para, it is believed that an exceptionally good crop of rubber will be harvested in that province this season. The rubber fields of the lower river, and especially in the islands, are slowly but surely failing, both in quantity and quality, but the decrease is more than made up by the development of new fields and the expansion of the old fields on the Upper Amazon. While all the more important tributaries of the Amazon are supplying their full quota of rubber, and even making a promising increase, interest, he says, will be centred in the now famous Acre territory and in South-Eastern Ecuador. In the regions reached by the Purus (of which the Acre is a tributary), Jurua, Beni, Madre de Dios, Javari, Ucayali, Japura and other great effluents of the Upper Amazon, which penetrate Peru, Bolivia and Ecuador, there are illimitable rubber forests as yet unexplored, which will now be gradually developed. Many seringueiros, or rubber gatherers, are making their way to these regions, and it is reported that several syndicates are about to begin operations in new fields in Bolivia and Peru.—*Home paper.*

## FOR HOUSEKEEPERS.

"For keeping meat in hot weather.—Boil water until it whirls, and put the meat raw into it directly it comes from the butcher. Keep it in the water for ten minutes only—it can be either boiled or roasted afterwards."—*Home paper.*

## GUATEMALA AGRICULTURAL PROGRESS.

According to the report by H M Consul at Guatemala for the year 1901, it is stated in the Government report issued by the Agricultural Bord of Guatemala that considerable progress has been made in the acclimatisation and cultivation of various new products. To this end there has been imported from abroad seed of cotton and tobacco, maize from Chalco and Texcoco, Australian oak and other timber, &c. These seeds have been distributed amongst the agriculturists of the different zones so that experiments might be made. The Agricultural Board has had leaflets drawn up on such products as are new in the country, and distributed amongst all agricultural classes, so that the most modern and scientific rules as to planting, &c., might be observed when making experiments. There has been a great impulse given to the production of such grains and vegetables as are largely consumed in the country, more and more attention being paid to the cultivation of maize, beans, potatoes and wheat, and remunerative prices have been obtained. There is no doubt whatever that there is room for many vegetable and dairy farms, especially in the high-lying districts and in the neighbourhood of the larger towns, and many of the smaller proprietors are turning their attention in this direction with result pecuniarily satisfactory to themselves. *Annual Series*, 2,868.—*Board of Trade Journal*, August 28.

## BIPEDAL LOCOMOTION OF A CEYLONESE LIZARD.

I have frequently observed with interest the erect attitude assumed by the small Agamid lizard *Otocryptis bivittata*, Wiegm., when running rapidly, and have long suspected that the short front legs were not used at such times. But the rapidity with which the animal runs, and the nature of the ground which it usually frequent, have prevented very close observation. I have, however, recently fully satisfied myself that its action is truly bipedal. The lizard happens to be common in the Botanic Gardens here, and on several occasions one of them has crossed a smooth sanded road immediately in front of me. I have thus been able to see clearly that the anterior limbs are carried quite free from the ground, progress being effected solely by the long hind limbs.

It seems possible that the closely allied and similarly built lizard *Sitana ponticeriana*, Cuv., may have the same habit. Does the Indian species of Otocryptis (*O. beddomii*) progress in the same fashion?

At present the habit has been recorded only of one or more Australian lizards, notably the "frilled lizard" (*Chlamydosaurus kingi*), which has been very cleverly photographed in the erect attitude by Mr. Saville Kent.

E. ERNEST GREEN.

Peradeniya, Ceylon, August.
—*Nature*, Sept. 18.

## EFFECT OF FUEL OIL.

### HOW THE SUBSTITUTE FOR COAL HAS CHEAPENED FREIGHTS.

Sir Marcus Samuel has just called the attention of the British public to the possibilities of the future in connection with the substitution of oil for coal as a fuel for steam vessels. The steamer "Pectan" of the Shell Transport Company, has made a successful trial trip. Mr Melrose, of the U.S. Navy Department, predicts the use of oil in the near future as fuel for war-vessels. They might have gone farther and told of the remarkable conditions now existing on the Pacific coast of the United States. There fuel oil has long passed the experimental stage. Over fifty steamers now sail from the port of San Francisco with oil for fuel. The steamer Mariposa has just returned from Tahiti, a return trip of 7,200 miles, under steam generated exclusively by oil. Pressure and speed were easily maintained, and she reached port one day a head of her schedule. Her fuel cost just half as much as coal; there was no expense for painting ship such as is necessary when coal is used. Particularly interesting is the opinion of Lieutenant Winchell, who has reported on the voyage for the United States Government, as to the character of men that should be employed in the fire rooms where there is an oil-fuel installation. It neither requires physical endurance nor previous training with coal fire. The me

placed in charge of the contrivance, however, should have mechanical aptitude, and possess readiness of resource and nerve. The senses of sight, hearing, and touch must be exercised at all times, since it is essential to keep a good look out on the furnace to note by the sound the working of the blowers, and the completeness of combustion, and to check by the sense of touch the workings of mechanical contrivances. If fewer men are needed in the fire rooms it is requisite to secure men of high intelligence, who can judge quickly as to the tendency towards impairment.

THE MONEY SAVED.

Less space was occupied, the fixed charges for labour were greatly reduced, the feeding of the fuel took less time and cost less. In fact, no disadvantages, were discovered, and the advantages were manifold. It is estimated that on one troopship making the trip from San Francisco to Manila and return the saving on fuel through the use of oil has been at least £5,000 for every such voyage. The result of the lack of demand for coal is remarkable. In San Francisco harbour alone fully £600,000 worth of capital in ships has been forced into idleness. Shipowners and skippers no longer find it profitable to voyage to Japan and Australia and return to San Francisco, awaiting cargoes of grain to Europe. The competition in carrying the small imports of coal has been so keen and the freight rates are now so low that the shipowners prefer to have their vessels idly ride the becalmed waters of the bay rather than take the chance of obtaining valuable cargoes in foreign ports. One of the benefits is that grain importers of California can obtain low rates to Europe. The vessels engaged in carrying coal are usually designed also for the grain trade to Europe. As this coal trade is gone, there is only one source of revenue left, and that is the grain trade. Here, again, keen competition has entered, and as a result there are low rates on grain to European ports.

COLLIERS OUT OF WORK.

Twenty-three shillings is the present low price for a grain charter from San Francisco to Great Britain or the Continent. The use of fuel oil has put the colliers out of business, and in turn they have sought operations in other channels. The rapid increase in the shipping facilities of the world due in great part to the artificial demands for transportation growing out of the South African and Spanish wars, has induced a reduction in ocean freight rates for cargoes in bulk, and to that extent favoured the farmers and producers, if not the manufacturers. This favourable situation is accidental. When Mr. Morgan and his associates shall have completed their transportation arrangements, an oil-burning equipment for every vessel being a projected part of the plan, the tramp steamer will be out of the running. In connection with this oil question the Standard Oil Company has a great fight on its hands in California. The trouble lies between the Standard people and a big oil and transportation company. The Standard Oil people are building a pipe line 200 miles long from the great oil-fields in Kern County to tide water in San Francisco Bay. The Standard Oil Company will use this pipe line for the transportation of oil from wells acquired by the corporation. It will also carry oil for producers. The rate of transportation to producers will conform to that of the railway companies connecting with the oil-field, as the Standard Oil and the Southern Pacific and Santa Fe Railway Companies are working under a tariff agreement.

CHEAP OIL.

A big California corporation, which owns some of the best wells in the oil district and owns a coast line of steamers engaged in the oil-carrying trade, has surveyed a direct route from the oil-field to ocean, and has agreed that if pledged freight to the extent of 10,000 barrels of oil daily it will build a railway, and thus furnish relief to the owners of wells having no connection with the Standard Oil Company or the railway companies. Thus far freight to the extent of 9,000 barrels of oil daily has been guaranteed. This fight is a very pretty one because the Californians in it are worth, in the agregate, £20,000,000, and have already had several successful skirmishes with the railway companies. The outcome of the fight will be that oil will be the cheapest thing on the Pacific coast or the two companies will combine. The latter is the outcome to be expected. The issue of this shipping congestion is in doubt, but it will make American competition keener than ever, for the ocean freights will be so slow that they will be but a small matter in figuring prices in any part of the world. This will include the transportation of fuel oil for sale, and with the present situation along the Pacific coast in view it is but reasonable to suppose that a great majority of steam-going vessels will within a few years have substituted oil for coal. There is plenty of oil in the United States, and much in other countries. Its price is merely a question of transportation, and that again is merely a question of the construction of pipe lines to tide water. The last naval Appropriation Bill passed by the Congress of the United States carried an item of £4,000 for experiments to be made with oil on naval vessels and these experiments are now in progress. The same plant which has been used for years to test the efficiency of different grades of coals is now being used to test oil, a fact which speaks for itself. It may soon become a question with the various peoples of the earth not as to the future coal supply, but what of the oil supply? The balance of trade may hinge on this in the future, for the cheapest transportation governs the market.

J. D. WHELPLEY.

—*Home paper*, Sept. 23.

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## RUBBER PRODUCTION IN SIAM.

H. S, Consular Assistant at Bangkok reports that among products which do not yet take a regular place in the exports of Siam, but for which there may be a future, is undoubtedly rubber. The question is now under consideration, and it is known that rubber-producing trees are found in some quantity in certain parts of the country, notably in the eastern province. One or two small experimental shipments have already been made, but little is known at present of the product or the possibility of cultivation, and the Ministry of the Interior are prosecuting enquiries. It is believed that traders from the French side of Mekong have been obtaining rubber from the eastern provinces of Siam for some times.—*Board of Trade Journal*, September 25.

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## BRAZIL CACAO CROP.

The United States Consul reports that the cacao market has been steady at average prices, and the demand fully equal to the supply. No

crop in Brazil is subject to such fluctuations as cacao, and for this reason comparisons with previous crops are valueless. Little interest is manifested in the product in this region. The total shipments from the Amazon for 1902 have been :—The total for seven months, January to July, being 2,890 tons. Something more than one-third has been taken by the United States, and the balance by Europe. France, as usual, is the largest consumer, with Holland second. The trade with the United States is, however, increasing, and before long that country will doubtless consume the bulk of the cacao product of South America.—*Board of Trade Journal*, Sept. 25.

## MANURE YOUR COCONUT PALM.

Under this heading, an esteemed correspondent sends us the following valuable particular :—

There is a coconut estate in Heneratgodde which it is worth while to look at for those who are engaged in that occupation. The soil is generally hard and composed of large gravel, except as usual in the Agras. The trees stand, some 18 feet apart, some twenty, and some twenty-four. Almost every tree bears its indelible marks of early neglect. When the present proprietor took the estate in hand some six or seven years ago, the average yield per tree was ten nuts in the year. This can be readily believed when you look at the trees on the estates surrounding this one. For, they are certainly incapable of yielding more than ten nuts. By persistent manuring the present proprietor of the estate of which I speak has raised the average step by step to something over fifty nuts already. He is not likely to stop until he reaches the round hundred. I have obtained an average of 135 on an experimental block of two and a-half acres where the situation, soil, age and distance between trees are all more favourable. Some of those trees have given me more than 200. An average of 100 is, therefore, no impossible result for a proprietor who manures.

According to general experience a weak tree standing in the midst of strong healthy ones never regains its strength so as to bear as well as its neighbours. What I saw on the Heneratgodde estate seems to be exceptional. A weak tree standing among, and having a trunk the circumference of which is scarcely one third of that of its neighbours, bears here as well as they.

The cost of the manure used and its application cannot be computed at less than one rupee per tree, which represents the value of 25 nuts. Anything therefore that a tree-yields over 35 nuts must be put down as clear gain. Add to it the gain from the breeding of cattle, deer, sheep, pea fowl and bee, which takes place on this estate, and no proprietor has cause to grumble over the smallness of the return from the coconut as compared with other industries. The worst that can be said against the coconut is that it takes some 25 to 30 years to bear on hilly ground, though it flowers at the fifth year and brings a good income about the tenth year in lowlands composed of alluvium.

In Jaffna and Batticaloa it is usual for the natives to manure and plough their coconut estates. In the Colombo District only a very limited few do it. It is a means of quadrupling the income of one's estate. But here one prefers to extend one's acres instead of increasing the yield by manuring and ploughing a limited area. There seems to be no remedy for prejudice."—Ceylon "Catholic Messenger," Oct. 14.

## CACAO.

### EXPERIMENTAL PLOTS AT GRENADA.

A report by Mr. Murdo McNeill, the Agricultural Instructor for June last, gives an account of the work done in connexion with the experiment cacao plots at Vendome, Belle Vue, Vincennes, Nianganfoix and Columbier estates, and other agricultural efforts in that colony. Considerable improvement is recorded in the condition of the cacao trees in these plots since they were placed under the care of the Imperial Department of Agriculture. 'Results of the manurial experiments have been so far extremely satisfactory. At Nianganfoix estate, on Section A of the plot treated with pen manure, only an average yield of 5 bags per acre for the last two years were obtained, while on Section B, to which basic slag followed by sulphate of ammonia had been applied, an average yield of 6 bags per acre was obtained in 1900, and of 8½ bags per acre in 1901. This would seem to indicate that the latter method of manurial treatment is the one most likely to prove successful in renovating old and neglected cacao trees on red clay lands in the interior of the island. Several visits were paid by the Agricultural Instructor to the holdings of peasant cultivators and, where possible, practical demonstrations were given in budding oranges and other plants. Efforts are also being made to encourage the cultivation of limes in localities unsuited for the growth of cacao, and allusion is made to an interesting experiment in reforestation at present being carried on by the Hon. W. H. Lascelles near the Grand Etang Lake.' The trees which consist of the native 'gommier' (*Dacryodes heandra*) planted 4ft. apart either way, are now two years old and are described as 'being' from two to two-and-a-half feet high and growing well.'—*Agricultural News*, Aug. 30.

## WEEDING OF GRAIN IN INDIA.

In the hilly districts of Western India, along the Sahidra mountains or Western Ghauts, where rain falls nearly every night during June to September, and even in daylight hours the clouds descend with striking frequency, the weeding of the principal grain crop, called Natchni, is a carnival of hard work, conducted on a communal system.

The crop is a very prolific small-grained cereal, grown on steed hillsides under heavy rainfall, and transplanted when about a month from seed-sowing. Botanically it is Eleusine coracana, known as Natchni, Ragi, and many other names in India, Thibet, and Abyssinia.

Word having been sent round that the field belonging to Bagu, the son of Babaji, is ready for weeding, all the workers of the village, propably 100 or more, assemble soon after daylight at the house of Bagu. It may be raining heavily, and Bagu's house is not commodious ; but as each guest carries a rain-hood made of split Bamboo and leaves, giving protection from crown to hip, and has Nature's water-proof on the limbs, the lack of house room is of little consequence. The guests arrange themselves in a semicircle, with back to the wind and with the knees at the breast, sit on the heels as only an Indian or a coal-miner can do, and eat a hearty breakfast of boiled Natchni, flavoured with Chillies and Asafœtida, amid discussion of the season's prospects and the character of the latest tax-gatherer. Then, headed by the village musician beating a drum with his hands, they proceed in single file to the field, and range themselves on the windward margin ; at a signal the weeding-hooks are unhitched, the naked brown legs, doubling in front of the body, disappear as by magic, and weeding is started in time with a harmonious refrain, describing the mercy of the gods, the liberality of their employer, and the probability of dinner being equal to their sumptuous breakfast. But this only a prelude ; the drum is tapped faster,

the voices rise higher, and the weeds are spitted with feverish energy as the song describes the doings of the old chieftains who held the mountain peaks, and took all they wanted from the people of the plains ; and the drummer in rear of the line dances to and fro, beating with frantic gesture wherever the line falls behind, and the wave of song passing along the line keeps everyone working with demoniacal energy, while the freqneut passing clouds leave everything dripping with water.

The field appears a quagmire, but from the steep slope and frequent rain the cultural result is satisfactory, aud from a distance the effect of the rude music, re-echoed from mountain and glen, is plaintive and weird as the notes rise and fall in gentle cadence, or scream with fierce joy of battle as the workers emulate the deeds of heroes on the hapless weeds.

Early in the afternoon the workers return to the house of their host, a bedraggled and worn-out crew, who have done as much work in six hours as is usually done in twenty ; they leisurely eat another meal, learn whose field is to be done tomorrow, and by sunset retire to their own homes, to repeat the orgie of labour daily while the weeding season lasts. G. Marshall Woodrow. —*Gardeners' Choronicle,* Aug. 23.

## THE TEA CASES (CUSTOMS) IN AUSTRALIA.

THE LEADING JOURNAL UPON THE CASE.

The Melbourne *Argus* of 19th September contains the following editorial on the above subject : —The decision given yesterday in one of the tea prosecutions instituted by the Minister of Customs affords another illuminating example of Mr Kingston's methods, Parliamentary and Departmental. Under the Commonwealth Customs Act certain regulations created a special standard for tea and special tests of which Great Britain and America know nothing. These regulations came into force in November. In ignorance of their existence, shippers at the Indian and Ceylon ports sent to Australia, teas which would have been accepted in other parts of the world, but which failed to quite satisfy one test of the several imposed by regulation. The ash, which should not exceed 8 per cent, was found to be 8.5 per cent. In other respects the consignment more than satisfied the artificial standard set up here. The aqueous tea extract was said to be more than 26 per cent. above requirements, and the soluble ash also was considerably over the stipulated percentage. In short, the tea was a thoroughly good and sound commodity, which in a detail fell short of the new technical requirements. Mr Blackett, the Government analyst, called by the prosecution, was fain to admit that " he believed the tea was perfectly wholesome, and, apart from the regulations, was fit for use." On the strength of this evidence, the Court, which has power to fine up to £100 for adulteration detrimental to the public health, declared that the minimum penalty of £5 would meet the case. This is the view a court of justice takes of an affair which Mr Kingston represented in the House a few weeks ago filled him with virtuous indignation and convinced him that he must do his duty or submit to the brand of cowardice.

Truly this Minister's ideas upon courage and veracity would form a stranger subject of analysis than any of the goods imported by the reputable firms whom he seeks to stigmatise for unfair dealing. If words have any meaning, his language when challenged by Sir Malcolm M'Eacharn on this very point conveyed that he was fearlessly exposing and punishing men who attempted frand and injury upon the public. He spoke of "those who would palm off Indian mud and charge for it ;" of "old and decayed leaves, nauseous to taste and without aroma ;" of "exhausted tea," of "rotten and decayed stuff." And the sequel of all this intemperate abuse, uttered by a politician quite unscrupulous as to what shifts he resorts to screen himselt momentarily from attack, is the complete moral exoneration of the first defendants proceeded against. It really passes patience that the Minister at the head of a department requiring above all things unprejudiced, judicial administration should comfort himself in this spiteful and reckless fashion. Even if the absurd contention be granted that all cases of simple error or accidental breach must be adjudicated upon in a police court, it surely does not follow that the defendants must first be "ragged" and rated by Mr. Kingston as a prelude to being found innocent of any wrongful intent by a competent tribunal. What Mr. Kingston flaunted as a high-minded championship of the rights of the consumer proves, in Messrs. Gollin's case at least, to have been simply petty persecution. The firm's application to be allowed to reship the tea, as is done elsewhere, was treated with contemptuous silence. The minister would be satisfied with nothing less than the destruction of the shipment—a course taken under sensible and civilised administration only where a commodity is certified unfit for human use. When new regulations are introduced, it is only fair to treat considerately shippers who have acted in ignorance of the new conditions. The fair treatment in this case was to allow reshipment of goods sound and wholesome in themselves and saleable in open market elsewhere, and shipped to this port in ignorance of the new tests. But Mr Kingston only saw in the incident and opportunity to exercise his authority and to lampoon the traders. Sir Malcolm M'Eacharn's refusal to follow the lead of such a Minister will now be explicable to his constituents.

## "CEYLON SILK-WORMS."

The following extract from a letter addressed by a well-known agriculturist in Algeria to the French Consul is of general interest and we have, with the permission of M. Labussiere, had it translated to lay before our readers :—

"As I intend to devote myself to various entomological experiments upon the various kinds of silk-worms more or less known, I take the liberty of making my request known, based on a purely scientific idea.

"The many ravages that are made in the silk-worm nurseries by diseases inherent in the domesticated silk-worms, have led me to believe, after many long years of experiment, that the best means of eradicating the disease which would ruin the silk-husbandry of France, would be to make some alliances between our domestic races and the wild ones.

"I would then make known to the Entomological Society of France, to which I belong, the results I should have obtained, and I hope, if I

succeed, to be able to create a race better able to resist disease. Cultivators would once more take courage.

"It appears that, in the neighbourhood of Colombo, there are different kinds of silk-worms, notably one called *Attacus Taprobanis*, living upon the cinnamon bush. The caterpillar of a green colour gives a large open cocoon in the shape of a pear, greyish brown. Could I obtain some eggs or some living cocoons, of these different kinds of silk-worm, or if not all, then of one of them, and would it be possible at the same time to inform me on what they feed? By lending me this help, you would enable to complete my work and would render a great service to science, which, so far, knows nothing whatever of those Ceylon kinds of worm. Of course I shall be happy to pay those who take the trouble to collect and send these."

In our Review of Agricultural and Other Industries in Ceylon, we notice "Silk-worms" and give a summary of what has been done in the past:—

"There is a spot on the banks of the Kelani river 3 or 4 miles above the Bridge of Boats *en route* to Hanwella called 'Orta Seda' or Silk Garden, where the Portuguese are believed to have fed silk-worms. The Dutch unsuccessfully attempted to propagate the silkworm, plant mulberry trees, and produce silk at Jaffna, (See Tennent, vol. 1, page 265.) Tennent also notices the presence of the Tusser silk-moth which feeds on the country almond (*Terminalia Catappa*) and the very common *Palma Christi* or castor-oil plant; but nothing has been done with the Tusser to make it a commercial success. In the British period Bennett takes credit for introducing the white and digitated mulberry (as well as the opium poppy), and on 21st September 1829 a Government regulation was passed to encourage the growth of 'silk and opium' among other agricultural produce. He thought the Northern Province eminently adapted for the silkworm and mulberry plant being the least humid part of the island; as Tennent thought it best adapted for the Tusser silk and castor-oil plant. Bennett gives instructions (page 217) for the information of mulberry nurseries, and he quite hoped to see silk a staple of the north of Ceylon. He proposed shading the mulberry plant with plantains and afterwards to grow an under-crop of Indigo."

We have never heard of the Ceylon silk-worm that feeds on the cinnamon bush; but our Entomologist. Mr. E. E. Green, will, we feel sure, tell us all about *Attacus Taprobanis*: whether it is likely to suit our Algerian friend's purpose, and, if so, the best way in which the Consul can secure and forward the needful supply of eggs.

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## THE CURRENCY QUESTION:

## BANKING AND MERCANTILE OPINIONS.

In view of the interest centered in the Currency Question at present, we have sought and obtained the opinion of some of the leading members of the Mercantile Community, and of some members of the staffs of our Banking Offices in Ceylon. We submit them as received:—

A leading Fort merchant and an old resident writes:—

"Most of the large rice and other business now-a-days is financed by bank drafts, or 'boondies.' For rice from some of the small Indian ports, rupees may be shipped, but I don't think to any important extent. The rupees taken to the Coast in quantity are taken by the Tamil cooly, I don't see why in a little time he should not take sovereigns and half-sovereigns instead.

"As regards local currency, what the local 'Times'' correspondent said the other evening is nonsense, *i.e.*:—'The latest idea is to force small coins on the public. The public have not demanded small coins and do not require them; it is merely another attempt to retain the Gold Ordinance in force, for the benefit of the Banks. If a large quantity of small coin is minted it will merely lie in the vaults in company with the sovereigns." Most people in Ceylon would be as well satisfied to receive two 50 cent pieces as a rupee and, if Government would expedite the issue of these largely, the pinch would soon be relieved. At the same time I do not see any objection to a *Ceylon* rupee, coined so as to be easily distinguished from an Indian rupee, being put into circulation here; it would meet local requirements.

"It would not, however, be current in India and we need never ask the Government of India to permit it, for the maintenance of the value of the rupee is partly regulated by their restriction of the coinage of it in India. A Ceylon rupee would have to be exactly of the same fineness and intrinsic value as the Indian one. We don't require a mint for this; they can be coined where the present subsidiary coins are turned out."

A very different view is taken of the situation by a Banker as follows:—

"Run on its present lines this Gold Ordinance will never work, and the sooner it is repealed the better for all parties. It is absurd to attempt to force the sovereign on the public, who not only don't want it, but it is an absolutely useless coin for many purposes. As well make the American dollar or any other foreign coin legal tender. The Treasury are at a deadlock and will not part with a single rupee; a disgraceful state of affairs. Let them ship off their gold to India at once and import rupees; it is not for the public to do this, and as matters stand it is really the public in the long run who have to pay the cost of importing.

"A Ceylon Government rupee would lead to many complications. If the Treasury are unfit to supply small coins, how much worse it would be if they ran short of their own rupees."

Per contra, a merchant in a big way thinks,—

"I cannot see why our Bankers should be exempted from obligation to bring *some* rupees from India, any more than that Government should be. Suppose I sell a sterling bill to a Bank here, the Bank agrees to pay me for it at a certain rate of exchange, so many *rupees*; presumably the Bank has them, but, if not, why should Government supply the Bank with these rupees? I am unable to see why a Ceylon rupee should lead to any complications. Bankers should pay for sterling bills with them such as I refer to above. The only person for whom Indian rupees are wanted seems to be the Tamil cooly, but surely it would not be much of a hardship to

require him to take sovereigns or half-sovereigns much more easily carried, and easily convertible in India. I can see no reason for undoing recent legislation and I would be sorry to see it asked for."

To this still another Banker responds :—

"Banks do import rupees for their own constituents and several lacs have been imported within the last week or two. When a Bank buys a merchant's bill it is payable in the currency of the island, notes or gold, which are legal tender, not necessarily Indian rupees. A Ceylon rupee would do well enough as a purely local token. Indian rupees are wanted by the trader as well as the Tamil cooly. The trader buys rice at small ports in India where there is no Treasury or means of changing a sovereign for rupees. If the Government wish to encourage the trade of the island, they should use the best means for so doing, and that is in assisting the small trader by supplying him with a coin that he can trade with."

But here again is the opinion of still another leading merchant, who is very outspoken :—

"We are very ready to blame Government in all things ; but if the cause of the present scarcity of silver in the island be enquired into, it will probably be found that the Banks have lately been importing unlimited supplies of gold at a profit and plugging Government with it in exchange for notes. They then take these notes to the Treasury and expect to get silver instead of gold in exchange. If the Banks find that they cannot supply their constituents with sufficient silver, why do they not import it, as they did the gold instead of looking to Government to do so for them ?

"The way for Government to prevent a recurrence of this state of things is to pass an Ordinance making legal tender consist of a certain proportion of gold and a certain proportion of silver, according to the ascertained average requirements of the community. The Banks would then be unable to flood the Treasurer with gold as they have lately been doing to their own profit, while grudging the expense of the importation of the silver they require."

Another Banker writes :—"Since the Government undertook to exchange notes for sovereigns the Banks greatly availed themselves of this mode of getting funds from India, when it was found necessary to import coin, not so much because sovereigns are cheaper to import (the difference between the cost of importing rupees and sovereigns is slight) but because the gold coin is so much easier to handle than is the rupee. Notwithstanding this, Banks have quite recently imported considerable quantities of rupees from India. What merchant in Colombo ever receives actual coin from the Bank in exchange for bills purchased, and if the Bank insisted on paying him in coin what would the merchant say ? A Ceylon rupee would lead to no complications so far as internal circulation is concerned; but the native who trades with small Southern Indian Ports where there are no Banks would not require them. He wants something which is easily passed there, and the only thing which suits his purpose is the Indian rupee. Why he should not pay a premium for them here is another question. Up to the present the Banks have been good enough to import them for his benefit. The Tamil cooly also wants Indian Rupees but in smaller quantities than the trader does. Had the Government before making the sovereign legal tender, appointed a small Committee of officials and representatives of the Mercantile Community to discuss the question, probably little would have been heard by the outside public about the Currency Question. Merchants should not overlook the fact that they benefit when Banks have a cheap and easy way of laying down funds in Ceylon inasmuch as they then get a better rate of exchange for their bills."

A member of the mercantile community, of some considerable experience, says :—

"I think Government is bound to produce rupees if that is the currency of the country. The Government of India makes about 6d. profit of every rupee she supplies to Ceylon and I certainly think she should give the Ceylon Government a share of that. A few years ago, when the value of silver was about 1/4, they made nothing, but now the value of silver is down to about 10d. and they still sell the rupee for 1/4. If this question had been brought up when the value of silver went down and when the exchange was fixed at 1/4, I think the Government of India would have acquiesced at once. With regard to the coining of rupees in Ceylon I think it would be very much better if Ceylon continues to get her supply from India and succeeded in getting a share of the profit which India gets at present—sufficient at least to cover the expenses of taking rupees from India to Ceylon. Government might threaten to coin her own rupees in order to coerce the Indian Government into giving a share of the profits."

Another merchant takes a decidedly anti-official view :—

"The first principle in currency legislation is or should be—*convenience* *i.e.*, to facilitate the machinery of circulation whereby the commerce of the State is furthered. The stability of the rupee having been secured before the gold standard was established, the latter was not a necessary corollary and its imposition would only be intelligible on one of two grounds—(*a*) convenience in circulation and (*b*) a byway to profit for the Government.

"I believe this latter view has been before the authorities and inasmuch as it has been proved that the gold standard has seriously interfered with the smooth running of the country's trade and chief industry (See Hatton Bank's recent advertisements)—there is, to my mind, no justification for its continuance. To hamper the industries of a country for a little immediate profit is a proof of narrowness and want of statesmanship which sometimes marks those who are only experimentalists in finance—who lose the main principle in the attempt to carry out ingenious theories. I see no object in a Ceylon Government Rupee. We have all the needful machinery for the proper production of a silver currency close by. —Government largely profits by its own minting and the only aim, therefore, should be the weal of the State."

Yet another Banker :—"It is perfectly true that the Banks are importing gold to a considerable extent, but Government brought in an Ordinance, after, presumably, 'due deliberation,' notifying that they were prepared to receive sovereigns and why should not the Banks act up to the Ordinance as I may say Government is doing. Government in the Ordinance have the option of issuing gold *or* silver in exchange for their notes and they are exercising this option by issuing sovereigns and refusing to issue rupees,

"In the articles and correspondence that have recently taken place, the fact that Government is making R200,000 a year profit of the currency has apparently been lost sight of. Surely with this profit Government can afford to meet the requirements of the Colony, for it must be borne in mind that the profit on the currency is made out of the Public not out of Government money.

"If Government wish to put a stop to the present dilemma, they should cancel the ordinance and revert to the former position which worked satisfactorily for all parties concerned. As regard the position of the Gold Currency in India, the Indian Government will freely exchange rupees for sovereigns at their currency offices and this is exactly what the Ceylon Government will not do; hence all this inconvenience. If the Ceylon Government was not prepared to meet the public as the Indian Government has done, it should not have introduced the Gold Ordinance at all. The Indian Government, when the gold coinage was introduced, endeavoured to force sovereigns on the public, but soon found the public would not take them and gave up the attempt. Gold is of no use to native traders; they require silver to pay the small men with, to whom a sovereign is of no use unless it can be promptly changed for an equivalent in rupees.

"This cannot be done and, therefore, sovereigns are refused. A premium is now charged to change a sovereign into silver in the bazaar here, and I am informed a much higher premium up-country and in villages outside Colombo is ruling."

## THE FUTURE OF GREEN TEA MANUFACTURE:

### AMERICA ENTERS AS A COMPETITOR.

Those men in India and Ceylon, who have expended brains and money in working out and perfecting new processes for green tea manufacture, will have to hurry up with their patents, or they may be left behind by our American cousins. The South Carolina tea-growing experiment, which has made a good deal of noise for its size, and inspired many a spread-eagle "scare head" in the pages of the American daily press, is still pushing its way into notice, and has, according to the *Boston Herald* of the 7th September last, induced Congress to grant a sum of $10,000 to be expended in further "green tea experiments." The illustrated printed page which is devoted to "booming" the Pinehurst venture, has this startling legend in large type:—"Green tea made by machinery at the Government Plantation. Discovery destined to drive Foreign Brands out of the American Markets." There is no secret made of the new process, which is to produce the green tea of the future, and start it on its conquering career. The prophetic soul of the journalist, who writes the subject up, "wears his heart upon his sleeve," takes the American public into his confidence, and is as open with his information as he is far-reaching with his vision. The green leaves, he tells us, are tumbled into a revolving metal cylinder, and exposed to a high temperature of about 400° Fahr. Inside of the cylinder are flanges which catch up the leaves and keep them constantly tossed about. And that is nearly all! Of course, there are spicy paragraphs over and above which are purely scientific—sops thrown to the sapient souls among the *Herald's* readers—where much is made of "volatile oils," "oxidising processes, 'chlorophyll" and "enzyms;" and which must cause the constituency of the paper to feel that when all is done, its intelligence, at least, is not affronted. It is a high note that is sounded throughout; but then there is nothing American intended to win the ear of American public which finds its way to notice on a minor key. "Secretary Wilson," we are told "believes that an excellent quality of tea can be produced in the Southern States at a cost of 20 cents (American) a pound, but there will be more profit in growing teas that retails at $2 to $20 a pound! There are plenty of rich people who are willing to pay such prices for teas which are of proportionably high quality." Happy American tea-growers! Ceylon might well question the advisability of sacrificing so much money to win for its green teas, an honoured place in the American market; but a corner of the "purdah" has been lifted on the Pinehurst venture, and there is disclosed the comical fact that 125 lb. an acre is the average outturn for a year's working! As we read these figures we are permitted to see that from whatever quarter of the globe the "hustler" is to come who is destined to displace us as the tea-growers for the world, it cannot be in South Carolina that we shall look for his advent.

The Pinehurst tea plantation is pretty much on a par with the ideal American infant of whom we read and marvel at. This child has a mission from the day it draws its first breath, is an object lesson to all other infants, and has the theme to demonstrate of "How to do it." The American infant is said to be able to amuse itself from the very first: objects to being walked about or fooled around with: wants a quiet time for thought: takes regular meals and when duly replenished, displays no weakness for more; keeps decent hours, and is *never* known to awake during the night! So it is with Pinehurst. Has it not amused itself from the first with its meagre acreage of tea trees, and tickled the fancy of the Eastern Planting World as it tabulated its total yearly crop of 3,000 lb.? Has it not insisted through its newspaper press and its Congress votes on being taken seriously, not a thing to be dandled or fooled around with: a wide-eyed bumptious youngster, appearing before the world attired in "scare-heads," and newspaper illustrations? Has it not a great future before it, on which at the slightest provocation, the American press fastens its attention and tootles to its glory in the highest of "high falutin" strains? Ah! we are reminded that Ceylon too has an American Commissioner who, on a handsome salary, is supposed to ceaselessly forward the interests of Ceylon tea in the great Republic; and has for years been in a position to learn

how best to frame a statement, write a telling letter or make a taking speech, in order to win America to the drinking of our fragrant beverage: but when we contrast what he has done and at so high a figure, with what Pinehurst has accomplished—and for nothing—through the press especially, it is rather a humbling affair. It makes us think that although we *are* the people,—wisdom, after all, does not dwell with us.

However, Pinehurst is not likely to disturb the equanimity of the Ceylon tea-grower, with its pickanniny labour force, and a total tea outturn which would hardly affect the dividend of any decent-sized property in Ceylon, were the whole handed over to it as a gift. But the Americans are an ingenious and clever people, and it is not at all unlikely that when they take to training their brains on the mechanical appliances needed for tea manufacture that the effort will result in a good shot. For black teas, there is now really no necessity for anything new in the way of machines, the market being fully supplied. It is to perfect the manufacture of green tea, that the chances of today lie. Neither India nor Ceylon really need mechanical assistance from any one, there being plenty of local talent about. But now that South Carolina has taken to green tea manufacture, and has to model and make its own machinery, it is quite on the cards that the Premier Green Tea Apparatus may yet be of Western manufacture, and the product of the American brain!

## PATENT GREEN TEA FISHING MACHINE.

In a couple of days more, Mr. Alleyn and his Agents, Messrs. Brown & Co., will come before the public with an invention in a new machine which, it is claimed, will produce true finished green teas, without the use of pans or other hot air apparatus,—teas which can compete with the best greens of China and Japan. This is important news for the Planting Community, more especially as the time taken—3½ hours—to turn uncoloured teas into true greens, is so moderate, and since no colouring or extraneous matter, whatever, is used. Considering what it can do, the price of the machine, R1,500, is by no means heavy; for, finished green teas fetch a good deal more than the ordinary raw greens. We congratulate Mr. Alleyn on bringing his invention to a successful issue, and we hope he and his agents may be well patronised.

## USEFUL NOTES ON GREEN TEA MANUFACTURE.

To the Editor, *Indian Gardening and Planting.*

Sir,—I have much pleasure in giving you what information I can in reply to your correspondent's following queries:—

(*a*) What produce a metallic, steely taste in the cup, and how is this to be avoided?

Without personally witnessing the whole process of manufacture in your correspondent's factory, it is not easy to locate the exact cause of this objectionable flavour, as many things may produce it. However, if the following course is followed this defect should not be noticeable. The green leaf should be perfectly fresh, without any signs of natural withering, when it is first steamed or roasted into a flaccid condition for rolling. All external moisture from steam, dew, rain etc., should be dried off before the rolling commences. The steam should not be carried through rusted pipes, or allowed to come in contact with any rusty ironwork before it reaches the leaf. The pans should be made of hard cast-iron, not wrought-iron; and always kept scrupulously clean and dry. When the leaf is in the pan, it should not be stirred about with any metallic implement, but with a smooth flat round-edged piece of wood, and a cotton cloth pad.

(*b*) How to avoid too green a colour, and obtain a uniform grey green, without artificial colouring?

The Drummond-Deane system has a tendency to produce a rather greenish tint. But a thorough panning, with the precautions previously mentioned, ought to modify the colours naturally to a grey-green. The panning is at fault somewhere.

(*c*) How is a grey colour produced with artificial colouring matter?

Such a shade can easily be brought on by putting a teaspoonful or so of fine pulverized soapstone (steatite) in four or five pounds of tea during the *last* panning, which should be carried on till all the soapstone has been taken up, and the leaf has assumed a glazed grey appearance. All artificial colouring should however be avoided, unless it is especially demanded as in the Asiatic markets. The vernacular name for soapstones is *sailkhari.*

(*a*) How is gunpowder tea manufactured?

The round gunpowder tea cannot easily be produced with any of the ordinary rolling machines. The roundness is the natural result of special hand rolling, and also rolling the leaf separately with little flat boards in a circular figure of-eight way on a flat surface. The Chinese recommend the addition of a little gum during this process. This class of green tea may be considered a by-product of Young Hyson and Hyson, and I do not think it worth the trouble of manufacturing. But if it is desired for any special reason, then all the coarser leaves should be sifted out after the first ordinary light rolling, and hand-rolled in the above described way. I once made a simple wooden rolling apparatus for this purpose, which did very effective work. But I consider it a mistake to multiply grades. Young Hyson, Hyson, and a little Dust and Broken Leaf, called *Samut* and *Sikkin*, respectively, by the natives, are the most paying kinds of green tea.

I hope in the above I have given all the information your correspondent requires; but without actually seeing the manufacture at any given place or time, I cannot be as exact in my replies as I would like to. I shall, however, always be most happy to help in all such cases to the best of my ability.

J B LESLIE ROGERS.

Amballa, Punjab.

*Indian Gardening and Planting*, Oct 23,

## THE GREEN TEA OF BENGAL.

REPORT BY MR. J. B. LESLIE ROGERS.

As desired, I have much pleasure in submitting the following report on two samples of Bengal green tea, lately forwarded to me.

No. 1. The "Deane-Judge" (coloured or finished) pure green tea:—Appearance approaching Hyson quality. Leaf well rolled and fairly even. Colour very fair, but not of one uniform tint, which should be a good grey-green throughout. Aroma, good but requires bringing out more. Infusion:—Leaf, a pale

olive, tending too *light* a green. Liquor, a good pale straw-green. Flavour, very fair, but not fully developed and slightly raw. Aroma, faint and evanescent."

No. 2. The Drummond Deane" (uncoloured) Appearance, Young Hyson mixed with broken leaf. Leaf rather flat and broken. Colour very mixed and blackish green, lacking the uniform grey green tint admired in China teas. Aroma, slight and not as good as No. 1. Infusion :—Leaf, pale olive, tending to too light a green. Liquor, a pale straw-green, but little too thin. Flavour, fair, but somewhat raw and undeveloped. Aroma, very faint.

General Remarks;—Both these samples must *undoubtedly be classed as green teas*, but the defects of amateur manufacture are still very apparent. The "Deane-Judge" I consider superior to the "Drummond Deane." The former, however, still requires more development in manufacture. I would suggest that the fresh green leaf be made more flaccid before rolling, while the drying and final panning should be continued further. The panning process is most important, as it enhances the aroma, produces an even grey-green colour, and gives the leaf a glossy finished appearance. And I am of opinion a through panning also greatly increases the keeping quality of green tea. I have drunk panned green tea from Dehra Doon fourteen years old, and it was as sound as on the day it was manufactured.

To my mind the Drummond Deane system, though an advance in some ways, is still an incomplete process. It does not go far enough and hence its defects. The pannel No. 1 Dean-Judge is and undoubted improvement, but even that requires further experience before it can be said to produce perfect green teas.

India has marked advantages over Ceylon in the matter of green tea and there is every reason to believe that we will eventually produce the better article. J. B. LESLIE ROGERS.

Umballa, Punjab.

## TEA IN THE UNITED STATES AND THE AMERICAN DUTY.

Writing to us direct from South Carolina under date September 15th, Mr. Charles U. Shepard, the pioneer of local "Tea Culture," reports as follows :—

"I have no further news to communicate than that the leaders of the dominant political party of the country are said to be seriously contemplating the re-establishment of the duty on foreign teas—and thus that Belgium will continue to enjoy the monopoly of a 'free breakfast table.' I should not be surprised to see the law in force when the present duty expires. But I shall beg for 20 cts. per lb."

Twenty cents a lb. is more than *tenpence*! An entirely outrageous impost, and Mr. Shepard must surely be in a jocative mood We trust he will prove a bad prophet in regard to any duty being continued on tea after the 1st January next. We are quite content to leave the market of Pinehurst or even the markets of South Carolina for all the tea Mr. Shepard can grow ; but surely he is interested in his countrymen elsewhere all over the States becoming consumers of his and our staple—and how is this to be accomplished if a prohibitory, or even the present, duty is continued? At present locally-produced American tea is such a curiosity, that it must command a fancy price, duty or no duty. And as to the future, we are quite content for Mr. Shepard—if he only refrains meantime—to head an Agitation for a 20-cent duty, on the day that the production and manufacture of *one million lb.* of American tea is reached. If this is agreed to, we think, we should be safe, and Mr. Shepard be spared the necessity of adding the role of "agitator" to that of "planter", for quite a generation to come --and by that time (1932 A.D.) the United States should want 400 to 500 (in place of 80) million lb. of tea per annum! So mote to be.

## TEA IN INDIA :

## MR. ALLEYN'S VISIT TO CALCUTTA AND THE INDIAN TEA DISTRICTS.

### NO INCREASED CROPS FROM INDIA TO BE ANTICIPATED FOR SEVERAL YEARS.

Mr. H. M. Alleyn is looking very well after his visit to Calcutta—a great city, but not to be compared with Colombo for cleanliness and scenic beauty—and the Indian Tea districts, including Upper and Lower Assam, Sylhet, and the Dooars. Mr. Alleyn was much impressed with the rich soil and fine tea gardens of Upper Assam, where very great attention is paid to the keeping up of a high standard in the teas turned out, through fine plucking and special attention to the manufacture. Generally in India, careful attention to the factory, through a special man, is the rule. In Lower Assam, coarser plucking is not uncommon; while in Sylhet the tea is not of the same quality; but in all these divisions, the labour question is becoming a very serious one, and entirely forbids the idea of any extensions of cultivation. In the Dooars, there is not the same difficulty about labour; but prices have, of late, become so unremunerative for the teas turned out, that greater care with less quantity is likely to be the rule. The soil is very fine. The idea of manuring to *increased* production, Mr. Alleyn found generally scouted—only to improve quality or maintain the condition of the trees is manuring sanctioned by agents or proprietors.

Altogether, Mr. Alleyn came to the conclusion that not much is to be feared from India for some years, in the way of increased tea exports.

## THE TEA WAREHOUSING QUESTION.

[BY AN INDIAN TEA PLANTER.]

The Calcutta correspondent of the *Financial News* recently referred to the possibility of a break in the Indian tea warehouse ring. He said: —"I am told that the warehouse charges as they now stand are often equal to the cost per case of conveying tea from Calcutta to London." I can say positively that this is actually the fact. My disbursements for freight (Calcutta to London) and

warehouse charges for the past two years stand as follows, viz :—

| | Freight. | Warehouse charges. | Quantity of tea. |
|---|---|---|---|
| 1901 .. | £106 15 1 .. | £112 16 1 .. | 67,930 lb. |
| 1900 ... | 111 17 3 .. | 115 1 6 .. | 67,547 lb. |

the number of packages being 803 (of which 150 were boxes of 10 lb. net) and 639 full-sized chests.

If complaint is made to the warehouse proprietor that his charges are excessive, he will say he can make no reduction, by reason of the proportion he disburses to the dock companies. This may or may not be so ; but it is impossible to get away from the fact that the bonded tea warehouse business is a protected one, inasmuch as there is reason to believe that the Customs authorities have refused to provide officers for warehouses beyond those now existing ; further, there are directors and shareholders of tea companies holding interests in some of the existing warehouses ; so what they lose at the one game they gain in the other.

These united forces, opposed to the weak combination of the planter-importer, and the lack of unanimity existing in their ranks, result in the payment of practically the same charges to-day as have obtained for years past, when the tea-planting industry was in a prosperous condition.—*H. and C. Mail*, Oct. 17.

## A CEYLON PLANTER IN QUEENSLAND.

It was necessary to buckle too here and get an "agricultural billet." So we started work at 5s per day for an Australian

M.L.C.

and did up his flower garden. After a week at gardening we had a few days' compulsory rest and got another job at 4s per day and omnibus fare 6d extra. When working in this way, an occasional cup of tea and some bread and butter were brought out and a short spell from hard labour was much appreciated. Our third gardening billet in Brisbane was a six weeks' job with a quiet family in South Brisbane, the other side of the beautiful new Victoria Bridge spanning the Brisbane River.

THE CITY OF BRISBANE

is very much improved in twelve years and has become a very handsome-looking town. There was great depression in business, of course, and wages were very low, indeed. Situations were very difficult to obtain, employees being dismissed instead of new engagements being made. Even the Queensland Government is "dead broke" or any way very "hard up" judging from their recent dismissal of some old and valued public servants including Mr Wragge, the clerk of the weather, and Mr Bailey, the Government Botanist ; also the staff of the Botanical Gardens including the "Ranger" and the "Propagator" and a host of clerks, in different departments of Government service left at the end of June, last, to save some thirty thousands of pounds per annum. It seems somewhat inconsistent to the writer's mind that useful men should be so roughly handled, and about the same time the tax was taken off tea and kerosine oil, making a dead loss to the Government of over £50,000. The labour party are said to have brought this about and it is likely there will be some more thinning out.

To return to my own personal experience : beyond smashing my thumb in a mowing machine I got on pretty well with my No. 3 Agricultural employer. My last Brisbane boss had a fine collection of French roses trained against the walls around the lawns and tennis court. On the other side was a very costly fowl run or rather four separate fowl runs for prize fowls. In addition to hatching naturally, we hatched artificially by an American Incubator and raised chickens at a temperature of 102°, so that my time was taken up pretty well both by day and night gardening and hatching chickens. The climate of Brisbane during June, July, and August (the winter months) was simply delightful rather cold at 6 o'clock in the morning and after 6 p.m., but a perfect climate for a white man to work in. Now the scene is changed : the hot weather is beginning in September, and the Northern ports of Queensland are awful places for ticks and "scrub-itch," also small ticks that torment a man and prevent him from sleeping at night. The days are frightfully hot and uncomfortable and the water is not particularly good in many places I have had to live in lately. Most of the private houses and hotels are roofed with iron, making them cold before sunrise and as hot as the place where there is no snow at midday. After taking a great interest in my work and raising some splendid drum-head, cabbages, carrots, tomatoes, lettuce, water-cress and other vegetables, in spite of the drought, my boss told me he contemplated leaving Brisbane for a holiday with his family and that I had better find another job. I accordingly wrote to a "Coffee Planter" in Mackay and received a favourable reply : "A three months' job" at £1 per week and

"TUCKER."

The ss. "Aramac" of the A U S N Company was leaving Brisbane for Northern ports. Our passage was delightful, smooth sea, bright moon-light nights and pleasant passengers. Mackay looked green and fresh three months ago, but is dried up now. Driving over the Bridge spanning the Pioneer River we came to an anchor at Cremorne Hotel surrounded by coconut palms. Mrs Keller made me comfortable at Cremorne, and the maid told me there was a good bathing place in the Creek, so we took soap-dish and towel, the former was not required for it was salt water ! There was a great kick-up in the town of Port Mackay and big guns went off and *broke the Hotel windows.* Everybody sang the National Anthem and the Band played "Sons of the Sea," it was a warm reception for me and celebrated Peace in South Africa.

MACKAY.

Mackay is a pretty little town with wide streets planted with shade trees in the centre of the main streets. Sydney and Victoria streets possess some good buildings and comfortable Hotels. Trade was very slack. A drive in the mail coach to the Leap through a large number of abandoned sugar plantations and shut down mills made rather a sad impression. There must have been a big sugar boom, for no less than *twenty-five* sugar mills have been shut down. Sugar is still cultivated in a small way, but the price is very low both for cane and made sugar. There is a great fuss about white-grown sugar, but very little of it produced up to date, Indians, Japs, Chinamen and other Asiatics are still working the cane fields and factories, the white man is at a considerable discount and it would

almost pay him to blacken his face! The Leap mail man dropped his letters and newspapers into the respeetive Post boxes nailed on trees by the road side. The Leap is a high mountain and projecting rock where an Australian "Gin" or native woman took a leap and passed into the next world when the Police were in pursuit of her husband. There is an Hotel and Post office but an exceedingly dead place—healthy situation, but no excitement but Kangaroo shooting and an occasional visit from Swagmen and poor fellows *on the Wallaby.* Mrs Hunter at the Leap hotel and Mr and Mrs Hill of the Post-office have been there many years, but are not making a fortune. "Shank's Mare" carried your correspondent to Mount Jukes. We met a mounted bushman rounding in cattle now and again and saw a small patch of sugarcane here and there with a humpy or leaf hut. Gum trees—Gum trees—nothing but, gum-trees? No water fit to drink in the creeks, a dried up-country and very uninteresting. We passed one good shaded creek where some ladies were picknic-ing and overtook me before reaching Mount Jukes. We were tired and covered with ticks on arrival in the house of the Manager of the Mount Jukes Company. The same evening arrived at my destination "Inglenook," Mount Jukes another small coffee plantation opened up by Mr. H. F. Blaxland who had sent for me on a three months' engagement on £1 per week and found in everything. Here I found very good coffee four years old.

THIS COFFEE

had been planted under dense shade, but not found to answer and the shade trees were "barkringed" and the coffee bushes are bearing better this year in consequence. For two months I opened the eentres and handled the trees and when engaged at the upper fields carried my lunch to the field after breakfast and a billycan of tea. The crop ripened in June, July and August, and we were gathering crop in September. Australian white boys gathering for five shillings per week and their "tucker" they gathered an average of 100 lb of cherry and had picked six thousand pounds of cherry up to the 6th of September when my engagement came to an end. Taking a cheque for £12 12s 0d for thirteen weeks, I waited in Mackay for a steamer to take me to Cairns where I was in hopes of finding another coffee planting engagement, but was disappointed after the expense of travelling long distances in visiting small coffee plantations. The train took me to the Barron Falls, a distance of 20 miles through 15 tunnels and a fine view of the Barron Falls and the fall of Stoney Creek. There was little water tumbling over the falls, but the scenery was wild and picturesque, the land too steep for planting purposes, only one very small coffee plantation situated upon the falls, the property of Mr. Alfred Street and worked by himself and three sons. The coffee had just given 7 tons from 10 acres and there were 4 acres more that gave less crop—10 cwts. per acre was very fair and the coffee was a good sample though only valued at 5½d per lb. Mr. Street could offer me nothing in the way of employment as he said

HIS COFFEE PLANTATION

only just paid its way working it with his family and a few natives to gather the crop, one son looking after the picking and ploughing between the rows of coffee planted 10×10 feet apart. Another son dried the parchment pulped by a Gordon-brest-Pulper, the parchment was being dried like tea on trays over a slow fire (rather a new *modus operandi*) in curing coffee for market, after hulling, it is roasted and ground and put up in tins. Mr. Street put me over the Barron river in his punt and we lunched at the Hotel near the Kurunda station, the train left at 4 p.m. to Cairns. Next day I took the steam tram to Hamilden plantation, chiefly sugar with a central mill.

SUGAR—COFFEE—TEA.

Dr. Reed, the Manager, advised me to go on to Hillville Sugar Plantation to see Mr De Moleyens and Mr Butter, but both were away from home and I had the trudge to Hillville through the bush for nothing. Mr De Moleyens was at the Cairns Hotel and told me it was no use going out to his coffee plantation as they were reducing expenditure and looking after the coloured labour themselves—so here I am in Geraldton, another Northern Port of Queensland. Under these circumstances I would strongly advise Ceylon men to stay away from Queensland for there is no hospitality as in Ceylon for a planter looking for a berth, long experience goes for nothing.

A small patch of five acres of coffee on the Company's place was handed over to a Chinaman because it would not pay working expenditure. In leaving Cairns for Geraldton seems to be "jumping out of the frying pan into the fire" for here the Banana gardens are worked by Chinese proprietors and there is no coffee worth mentioning

Geraldton is the only place where there is a good rainfall—120 inches in a year, just the climate for tea, but no one has ventured on its culture, and there is no experimental Government plantation. Mr Howard Newport from India lives at Redlynch near Cairns, and is the "Government Coffee Expert"—up to date he seems to have made a very poor show in the advance of the coffee enterprise.

We had a couple of days Agri-Horticultural Show last week, and I saw a sample of tea made from the bushes grown at Cairns, but it seemed poor stuff. I believe the bushes are to be kept for seed-bearers.

BAD INVESTMENTS.

Now, to give your readers some idea of wha has been done in coffee in Northern Queensland the only coffee plantation worth mentioning in Cairns, has cost four thousand pounds to open and does not pay. The Mount Jukes coffee plantation has got about five acres of good coffee to show for six thousand pounds expended; another little patch of *500 trees* called the Blackwood Coffee Plantation, cost £1,500 and gave 65 lb of coffee in cherry! Two other coffee plantations in Mackay are abandoned after leaving a heavy loss and Mr Wood, a book-seller in Mackay, offered me one "selection" for £200 (two hundred acres of bush with a Cottage, the coffee was burnt by a bush fire).

The above report by an old Ceylon planter may prevent Ceylon and Indian planters from making mistakes, otherwise, easily made by reading magazine articles written by tourists and globe-trotters who make up a "flash in the pan" article. I hope my next letter will be more encouraging to intending visitors to Australia who want to commence *de novo*. H. C.

## SUBSIDIARY PRODUCTS IN THE CEYLON PLANTING DISTRICTS.

When our Governor Sir West Ridgeway in one of his home speeches said that if Tea were to go, Ceylon might stagger, but would in time right herself, he doubtless had in his mind's eye, the Subsidiary Products in the Planting Districts, together with Coconuts, Cinnamon, Mining and Trade generally, as the ground of his confident hope. Individually none of these subsidiary products may count for very much, nor run in statistical tables into the magnificent line of figures which tea can tabulate; but they are there as helps, and in the event of a disaster to tea—which Heaven forbid—would prove as useful in such distressful times, as cinchona did when coffee suffered its total eclipse and the outlook for the Colony was hopeless in the extreme. Homilies on the ancient text "Don't have all your eggs in the one basket," have been preached in these columns with a persistency which to some, may have seemed tiresome, but cannot by any be adjudged unwise; and to place planters, who were desirous of embarking in a subsidiary way in products other than tea, the *Observer* press has issued from time to time up-to-date Manuals and Handbooks for instruction and guidance, not to speak of the evergreen *Tropical Agriculturist.* We are glad to think that although the wilderness we had to cry in was at one time wide, we have not cried in vain; and today, planting opinion fully recognises the wisdom of having more than one string to the bow, and has acted on it.

The difficulty, which meets the man who is bent on an extension of interests, and a partial insurance for the future, is to find the product that will pay best in the long run. We would emphasise "the long run"; for the energy of the Ceylon planter is proverbial, and it is not once nor twice his zeal has so outrun his discretion that an opening which would have led the few to pleasant fields and pastures new, has been rushed by the many, and trampled into a waste which was profitable to none. We have had cinchona which helped many a man in the transition stage between coffee and tea, turned at last—through overproduction—into a commercial drug in every sense, sinking into chaos. The "deepest deep" which memory can recall in the case of Ceylon produce, being a parcel of "bark" which failed to cover shipping and London charges, and brought as its only return to the unfortunate proprietor—a debit note from London: reminding us of a Kentish fruit farmer who in return for a consignment of plums to Covent Garden, got a memo. showing 1s 6d balance *he had to pay*! Cinchona has not been the only minor product that showed a fair prospect of a decent return for a time and then gradually shrank into the limbo of the unprofitable. There is, of course, an outside public that benefits by all this; but planting is not a purely philanthropic occupation, nor is it run fo the benefit of the outsider; and enterprise is liable to be checked when disappointment so frequently dogs its footsteps. Still, the lesson to be learned from the past is not to cease from doing; but to be wary in your doing. There is a call for men to think for themselves, for independence of action, and for avoidance of the ruinous policy of "Follow the leader."

Among the subsidiary products of the island, Cacao takes a first place, and given a suitable soil and location, it has, on the whole, done handsomely for its growers. It stands, however, more on its own feet than most other by-products, is a cult of its own, needs unwearied attention, special observation, and each tree has to be studied. The scare of the bark fungus has now given the coarser and stronger varieties a first place; but there has been of late a return to the old love, and the plump round red beaned Caracas is again in evidence. "We know now how to deal with the fungus when it appears" say the men who are venturing on it, and as "knowledge is power," the chances are in their favour.

Cinchona, after years of a discredited life, is again being played with; but there is a fearful pleasure connected with it. Not to speak of the chances of snuffing out—especially in the richer varieties—was there ever a more sensitive market than the bark one? The late slump in prices, brought about by unusually large shipments from Java, was not, we were informed, at all justified by the statistical position of the article. Yet a mere temporary increase in imports was productive of a serious alarm which found unpleasant expression in the lessened value of the unit of quinine. It is clear that cinchona is not a good stand-by for the man who *must* harvest; for if their numbers were to sensibly increase, there would be history repeating itself, and the tale of a vanished fortune would have again have to be re-told.

Cardamoms have, for some time, done so well that they have been extended both on estates and in native gardens. Activity too is reported from the world outside Ceylon. Companies, who have properties in favourable localities, sanction grevillea and other fire-wood clearings with cardamoms as an adjunct, to cover in time the cost of the extension; but while exports increase, prices decrease, and as the market for this spice is a limited one, the future is not without clouds on the horizon.

About Rubber there is a glory. *It*, at least, cannot easily be over-done and Ceylon has shown that it is capable of producing a quality which commands top prices. Its growers are enthusiastic: old planters who meet them, with the pride of possession tinging their speech, are reminded of the halcyon days of cinchona culture, when by a species of simple arithmetic the growing plants were panned into sterling coin, and the owner, who was usually the demonstrator, was proved to be in possession of a prospective fortune. It went in this way:—Bark is worth so much. Each tree carries so many pounds; there are an ascertain-

able number of trees to the acre, and the acreage of the estate is known: hence—and here the calculation ran into thousands. Even when the cautious had allowed 25 aye and 50 per cent for contingencies, what a smack of fat things still remained! Alas! the sequel. But there is less chance of rubber being overdone; albeit in every countryeof the habitable globe where the tree can b grown, men of all races are today devoting thought and time to its cultivation; while the hovering shadow of chemical research bent on finding a substitute for rubber. is a little disquieting when we recall the fate of indigo.

Other Subsidiary Products Pepper, Nutmegs, Vanilla, Annatto, Croton and such like minor ones, all increase the revenue of estates at little cost, and are each worthy of attention. None of them, perhaps. is usable as a crutch; but valuable as a staff. What each man has to do is to find what he should select as the best adjunct to his primary culture; and, remembering that Agriculture and especially Tropical Agriculture, is subject to many ups and downs,—stick to his subsidiary products till the dark days pass and be ready to profit by the bright ones when they dawn, which they surely will do sooner or later. Ceylon may have produced many disappointments; but it knows nothing of despair.

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## FORTUNES IN RUBBER.

### HOW AN AMERICAN FINANCIAL PAPER REGARDS THE PROBLEM.

One of the American financial papers, namely, "The Daily Financial News," of New York, has a long article on American enterprise in exploiting profitable rubber fields. This article contains a considerable portion of fact, but, when it comes to calculating the prices obtained for rubber it is very much out. For what it is worth, we quote it here:—

"Mexico is full of opportunities for enterprise and capital. The surest, cleanest and often the quickest fortunes are those made by, the intelligent development of the uncultivated resources of nature. "There is in the eastern and southern part of Mexico a long, irregular strip of land 15 or 20 miles wide, which has a soil as fertile as any in the world, and it is in this strip of land that the rubber trees thrive. Another fact that makes opportunity for Americans is that this rich territory, which was once almost inaccessible, is now reached by railroads which have been built through subsidies from the American Government. "By their crude methods the natives killed the trees which gave them a livelihood. Moreover, the native method tended to inferior rubber far from clean. For such crude rubber the nativos got about 20 cents per lb. Then came the Americans with intelligent business methods. In the first place, it was obvious that, inasmuch as the supply of trees had been reduced through their destruction by the natives, the first step should be to plant more trees. Immenso nurseries were started, the young, broad-leafed plants looking like fields of tobacco. The shoots are set out 400 to the acre. When they have started on a strong, assured growth they are thinned out, usually at six years old, and 200 are left standing. Each tree that is cut down at this stage will produce about 5 lb of rubber worth 70 cents, so that in this process of development each acre produces $700. In some cases trees are tapped for rubber milk when they are four years old, 400 young trees, tapped by native methods, yielding 44 lb, worth $30·80 at each tapping. It is usually considered advisable, however, to wait until the sixth or even the eighth year before beginning to draw the rubber milk. The bark is cut carefully, and only a limited quantity of the milk is taken at a time, so that the tree is not injured and its growth not in the least retarded. From an eight-year-old tree 1 lb of rubber a year may be safely taken. When there are 200 trees to the acre the product of each acre a year would be 200 lb of rubber, worth $140. This would be obtained without any expense or labour in maintaining or caring for the trees, the only work being the tapping.

ENORMOUS POSSIBILITIES.—"A man owning 100 acres would thus receive $14,000 a year income. But rubber trees grow rapidly, and as they increase in size the quantity of the rubber milk which they will produce grows in an equal rapid ratio. A tree nine years old will give 1¾ lb. of rubber; a tree ten years old, 2½ lb. in the same time; a tree fifteen years old will produce 5 lb. a year, so that 1 acre will yield 1,000 lb., worth $700, and the product of 100 acres would be worth $70,000. The enormous possibilities of the rubber business have led investors to buy large tracts of rubber land in Mexico, including Senator Clark, of Montana. Those who have bought rubber lands in Mexico have paid small prices. The land was formerly owned by native plantation owners, who did not cultivate it, being too indolent or too ignorant to develop its resources.

RUBBER FOR MARKET.—"American ingenuity has devised several new methods for getting rubber ready for the market. The milk is drawn from the bark by suction, so that the pure sap is obtained free from the grit, bark, and foreign substances which were always present in such large quantities in the rubber sold by natives. After the rubber milk is obtained the pure rubber is separated from the other ingredients of the sap, in much the same way that cream is separated from milk, by a patent process. In the new method introduced and practised by the Americans there is no waste of sap. By the natives half of it is wasted. When the rubber is coagulated it is tied up in bales and shipped to New York, where it sells at from 75 cents to $1 a lb. and the total expense of extracting it, separating and coagulating it, and shipping it to the Eastern market, is not more than 5 cents a lb. This shows enormous profit."—*India Rubber Trades' Journal* Oct. 13.

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## EXTRACTION OF RUBBER FROM BARK.

The question of extracting rubber from the bark of certain rubber trees has repeatedly been suggested and experimented upon. So far, little success appears to have been achieved.

It certainly does not strike one as a very difficult matter to devise a process for the extraction of the rubber from a bark which really contains a fair amount of it. But it is certainly impossible to devise such a process without any direct reference to be operated upon. In other words, a thorough chemical examination of the bark in question is the first step to be taken. Further, there may be a large quantity of rubber in the bark, but it is most likely accompanied by a considerable proportion of resinous matter, the separation of which from the rubber would be quite as important as the elimination of the bark. Otherwise it might be found that the rubber extracted is of such inferior quality as to be almost valueless commercially. This, to a large extent, is what has been found in the various attempts of extracting gutta percha from the leaves of the gutta trees.

The resin accompanying the rubber in the different rubber trees varies very considerably in properties, and unless these are known it is quite impossible to give any directions as to their separation from the rubber. If the amount of

resinous matter present should turn to be so small that its presence in the rubber could be tolerated there would still be the question of the nature of the tissues of the bark which has to be separated from the rubber. Under favourable circumstances, it is quite conceivable that this might simply be dissolved away by a careful alkaline treatment, in which case a very pure rubber indeed might be obtained. But it is impossible to devise an efficient treament of this kind without a very complete knowledge of the bark to be operated upon.

The first step towards the desired end is therefore obviously a thorough chemical examination of the bark referred to in the enquiry.—[Reply to Messrs C. & Co.—*India-Rubber Trades' Journal*, September 29.

## INDIARUBBER, GUTTAPERCHA, AND BALLATA:

### TREES SUITABLE FOR NATAL.

BY M. SEHOF.

Most people are under the impression that India rubber and gutta percha are the same product. This is not the case, as they come from different plants, and are used for different purposes. The Latin names show at once the difference—Gummi elasticum and Gummi plasticum—the former being the India rubber and the latter the gutta percha tree.

I once undertook a trading trip from Manaos, at the mouth of the Amazon, up the river in company with an old Spanish 'ragataos,' or trader, to supply the India rubber gatherers with foodstuffs, cotton prints, tools, etc. We bought our goods at the 'aviadore,' or merchant, consisting mainly of Farinha Maniok, garne secca (dried beef), salt, and also a good supply of cheap wine 'vino tinto' (red wine), and a few other things necessary to the seringuerios, or India rubber gatherers. It would take too long to give fuller details of this journey, which lasted close on nine months I may also say that though I spoke Spanish fairly well I had no knowledge of Portuguese, and yet my partner never once tried to take advantage of my ignorance of the language spoken in those parts. Besides ourselves we had four boys in the boat and about two tons of goods. Without many stoppages, we rowed and sailed till we reached the Tapajos, a southern tributary of the Amazon, and here I saw for the first time how India rubber is collected. Each seringueiro, also called cauchero, has his estrada, or district of about 100 to 150 trees.

The true and best India rubber tree is the Hevea braziliensis, called by the natives Xerringa. There are of course, many other kinds of rubber-producing trees and plants—Hevea guyanensis, Syphonia elastica, Manihot, etc. It is of the Hevea brasiliensis and the Manihot glazowii I wish to write, as of these two in particular I have personal knowledge.

The Hevea braziliensis is a large tree. I have seen some over 60 ft. high; it has pretty yellow whitish flowers, hanging in long bunches. The husk of the seed has a peculiar way of bursting open with a loud noise and ejecting the seed with considerable force. The leaves are large, and set in three on one stem. The cauchero goes out to work either very early or late in the afternoon, to tap his trees. When he is working in a part of virgin forest he very often has to cut his way through the vegetation to get to the tree he wants to bleed, and when there, his first care is to clean the tree and sweep round about. He then cuts with a single tap of his short-handled "machado," or hatchet the bark but never the wood. According to the size of the tree, from 12 to 30 cuts are thus made. He starts as high as he can reach, and comes down pretty low to the ground, and after each cut he fastens his little tin cup, or 'tigelinhas,' with a little mud under each of the cuts, into which the latex will drop, not flow, from one to three hours. If a slight rain happens to fall it will spoil the rubber very much and this is one of the reasons why many caucheros prefer to tap in the evenings as it very seldom rains in the evenings. An estrada of 150 trees gives about 35 to 40kg. of rubber in one tapping. Of course, this varies greatly according to the size of the tree, and whether newly tapped or whether they have already been tapped for years. In one year each estrada will be tapped about 20 times, and can thus give nearly 750kg. of raw rubber. The trees are tapped about every two or three days. Having fastened all his cups, he starts again at those he fastened first, and taking them down empties the contents into a tin bucket or gourd; never into iron, as this spoils the colour of the rubber.

If he has far to go to his huts he puts a little ammonia into each bucket to prevent the latex thickening, and if his huts are close at hand, the buckets are emptied into large flat earthenware pans. After the whole harvest is over, the real work of preparing the rubber for the market begins and there are many different ways of doing this. I have personally only noticed two ways.

A large earthenware pot with a narrow hole is filled with wood or with nuts of the uauassu (or Urucury palm which are plentiful on the Lower Amazon, Having lighted his fumeiro, the ground is carefully swept, and he puts his pans containing the latex close at hand to the fumeiro. As soon as he considars the smoke thick enough, the cauchero takes a wooden spoon, from four to six feet long (like a baker's peel); the broad flat end of this is first held in the smoke and then dipped in the latex. He allows a moment for any drippings to fall back in the vessel, and then quickly returns it to the smoke. The thin layer of latex sticking to the spoon dries almost immediately the water has evaporated, and the first thin sheet of India rubber is ready. The cauchero proceeds in this way, dipping his paletta, or spoon, in and out till he has a lump of rubber about 5 to 7lb weight; he then takes it off. It comes off very easily, and he starts again. These lumps are then dried in the sun for several days, as it is most important to get them perfectly dry.

The other method of smoking is to hold a long stick, which is flattened in the middle, over the smoke and is kept turning round, while the assistants pour the latex very slowly over the middle of the stick till a large roll of rubber is formed. These biscuits or loaves, as they are termed, as soon as they are perfectly dry, are carried on poles to the river stations to be exchanged for goods or money. India rubber of the Hevea braziliensis collected and prepared in this way, commands the highest price of all rubbers in the market. The price varies, according to the quality, at between 42; to 6s. per lb. in the European market.

There are two other trees which I wish to mention, because I firmly believe that both would be suitable for Natal. With one of these trees, the Manihot glazowii (Portuguese 'Manisoba Leitera'), I have had personal experience. At Sylva, which was then the terminus of the railway from Monte Video, Uruguay, the railway manager there gave me 1,500 two year old plants which had come by steamer from Ceara, Brazil, to plant out. The climate of Sylva is considerably cooler and certainly not wetter than that of Maritzburg, and yet these trees thrived well, although the soil was very poor, sandy, and rocky. Out of 1,500 1,200 grew into fine strong trees. They were about 8 ft when planted and in thirteen months stood from 12 to 13 ft high. I had also some seed which were very hard; I soaked them in water for five days, but three months passed before they sprouted. These seedlings in 8 months after sprouting were 4 to 5 ft high.

The Manihot, or Leitera, bears flowers and fruit. The fruit is something like a walnut, but very hard. It is tapped in its third year twice, allowing three days between each tapping. The rubber comes under

the name of 'Ceara scraps' on the market and fetches good prices, abont 5s per lb, each tree giving about 500g gum when 5 years old, 700 to 800g when 10 years old, and by careful tapping will last from 50 to 100 years and more. I know of no other trees which increase so rapidly and surely, and which require so little attention.

I have seen the Manihot grow in bare rocky ground, where every other plant is killed by heat and dryness, but the Leitera looking beautifully fresh and green.

The other tree is the Bassia parki, which is a North and Central African tree. I have seen it growing only in its wild state on the Upper Nile. It is also a very large tree, with long, dark green leaves, which stand in bunches at the end of peculiarly marked twigs. It bears a very pleasant tasting fruit, from which the natives make butter, which is known in the market as ghee or Karite butter. The fat of the fruit is also exported largely for the manufacture of soap and candles, and fetches good prices, and latterly the latex of this tree has come on the market as a first rate gutta percha, and has realised 1s 9d per lb. This tree I have only seen wild and have no further experience of it, but I believe it would grow well in Natal, and, what is more, would pay well.

Of balata I hope to write something in another issue of the *Journal*, as I have taken up too much space already.

[I have noticed with great pleasure some criticisms on my article *re P. insignis*. One of these, written by Mr James King, says that this or that particular tree, etc., should not be recommended for Natal. I did not recomended any particular tree, and distinctly said that I only mentioned P. insignis as an example how to plant a forest. To recommend any single class of tree for a whole country is, in my opinion, not very safe, and should be left to experts. —M Sehof, St. George's Estate, Hatting Spruit.] —*Natal Agricultural Journal*, Sept 26.

## CONCERNING COFFEE.

An international convention will be held in New York during November for the study of the production and consumption of coffee. At present, little is known of the best varieties as regards quality and methods of cultivation, the most profitable for different markets, amount of consumption and any other information that may tend to improve its use and quality. Hawaiian coffee, when care is taken in its cultivation, harvesting, drying and packing processes is not surpassed by any produced in other countries. Age adds greatly to the value of choice coffee. The pioneers in Hawaii had a practice of drying the berries in the sun for weeks, than bagging and storing for months drying in a loft. Those who can remember drinking genuine Kona coffee, will never forget the delicious aroma that filled the room when it was poured out at the breakfast table, reminding of the fabled "nectar of the gods." Customs change, however, with the passing years, and much of the coffee drunk nowadays is imported from the "faraway." A coffee plantation in Kona, Hawaii, well kept and with its crops well dried and aged, will pay as well now as in years past, if the coffee planters take care to have none but the best sent to market. Genuine Kona coffee is as good today as it ever was, but the older it is, the better its quality. In the American market, the principal coffees are the Rio, Maracaibo and Java. Pure old Kona, when genuine. is better than any of them.—*Hawaiian Planters' Monthly* for September.



## THE SILK INDUSTRY IN BENGAL.

In his annual report for the past year, the Director of Land Records and Agriculture, Bengal, states that the work done by the Bengal Silk Committee with the assistance of Government in rehabilitating the silk rearing industry of the Province by teaching the rearers how to eradicate disease, continued to prosper. Malda seems to be a long way ahead of other Districts in the number of intelligent rearers who have learnt modern ideas. Many old rearing houses have been properly ventilated, new houses are being built on approved plans, and the Collector reports that mulberry cultivation is extending all over the District, especially in Gour.—*Madras Mail*, Nov. 11.

## FERTILIZING BANANAS.

Experimenting on a banana plantation under irrigation, and where bananas have been grown for 12 years, sulphate of ammonia applied alone, very quickly give an impetus to vegetative vigour; the trees grew very large but produced bunches of very disappointing size relative to the huge plant. On another piece basic slag was applied; this fertiliser is rich in phosphate and lime, the trees were not forced to huge growth as with the sulphate of ammonia, but the bunches produced were very good and well repaid the cost of fertilizing. The bunches were about equal with both fertilizers, but the trees with sulphate of ammonia were the best looking. However, as the basic slag only cost £4 10s. a ton and the sulphate of ammonia, cost £15 a ton, the best net return was of course with the slag. An application of lime alone did not show any results where two tons and-a-half were applied per acre, but where five tons were applied the trees at once responded, the stems were stouter than on the rest of the plantation, and seemed very firm with very strong roots, and the fruit was much improved. Further experiments will probably be carried through with simple fertilizers like Bone Meal, which contains an appreciable amount of nitrogen, and is especially rich in phosphates; and with Coconut Meal from the Oil Factory, which contains nitrogen, phosphate and potash, but is richest in the first named. Then complete commercial fertilizers may be tried, that is, compounds of the different elements containing nitrogen, phosphoric acid and potash, calculated on the needs of the plants, and the soil, as indicated by the first simple experiments with single fertilizers. To get the maximum of crops the soil must be perfectly adapted to the needs of the plant, and the experiments are being carried through at some expense in the hope that some combination will be hit upon that will cause the fields to yield fruit quicker and of a higher grade, when, as in the case with fruit-growers generally in other lands. the result may give a good return on the outlay for fertilizing. The soil being already fairly rich in potash as shown by chemical analysis, no experiments have included potash, but in the great majority of soils, every fertilizer for fruit trees should be strong in potash.—*Jamaica Agricultural Society*, August.

A Crate of Orange Plants—from the Royal Botanical Gardens, Sibpur, Calcutta, arrived in the Darius on Monday. The case was consigned to the Secretary for Agriculture.—*W. Australia Morning Herald*, Oct. 29.

## MALARIA IN CEYLON.

The *Lancet* has the following on Dr. Chalmers Report on Malaria:—

Dr. Albert J. Chalmers, Registrar to the Ceylon Medical College, has made a preliminary report on the prevalence of malaria in Ceylon, with a view to its prevention. The report contains much instructive and useful information and deals with some points which have hitherto hardly obtained the attention which they deserve. The paper contains three addenda of which the first is devoted to an interesting theory to explain how man and the anopheles originally became infected with the malarial parasite, and the second gives a copy of a pamphlet on malaria which has been distributed to the various stations in Ceylon. The theory of the origin of the disease which is propounded by Mr. A Perry, Principal Medical Officer and Inspector of Hospitals, Ceylon, raises two points which are not without practical importance. They are: (1) Is it possible that the infection in man can take place by some other means than through the mosquito? and (2) If this be not possible how did the cycle of the life of the parasite start? In his account of the incidence of malaria in Ceylon, Dr. Chalmers first shows that the disorder is a powerful factor in the disease and death rates of the Island, and he proceeds to show that there is a definite relationship between the prevalence of the distemper and the amounts of the rainfall. In reference to the causal relation existing between the climatic conditions and the incidence of the malady the writer says: "There appears no doubt that the reason why so few, sometimes no, anopheles are seen in the dry season for months together—e.g., in Accra and Kumassi, West Africa—and then the sudden appearance of these insects in numbers is due to their hybernation in dark protected spots. They come out again in the wet season, as this is the time *par excellence* when they find the pools of water with suitable algæ for propagating their species and, in my opinion, this is the reason of the relationship between malaria and the rainfall." Dr. Chalmers states that at the date at which he wrote his report, he had not had sufficient opportunity of studying the anopheletes and their haunts in Ceylon to make an exhaustive statement on them, but that he had found the anopheles Rossii, an anopheles which resembled ("but not quite exactly") the anopheles vanus, and third which he calls anopheles X, in which the costal margin of the wing was "decorated with two white spots." It is incidentally mentioned that there had lately been a severe outbreak of malarial fever at Katancudy, during which Dr. Hallock, who was medical officer there, acted with great discernment and by promptly cleansing the village made at once a marked effect on the disease. Dr. Chalmers gives a brief account of the dwellings and of the habits of the different peoples who live in Ceylon—of the Europeans, Burghers and the Sinhalese, of the Tamils, the Mahomedans, and the coolies. The Hindoos, the Buddhists, and the Mahomedans are particularly liable to infection from mosquitoes, not only because they wear little clothing, but because their religious observances entail their attendance at the temples and at mosques during the night. Rice fields form a suitable breeding ground for the anopheles, and so well is this fact recognised that an Italian law passed as long ago as 1866 makes provision for regulations in regard to the distance from dwellings at which the culture of rice is permissible. In regard to Ceylon it is thought that such restrictions could not properly be made, but it is suggested that the building of new houses near to existing rice fields might advantageously be forbidden. The importance of educating the people as to the cause of malaria is insisted upon in the report and it is suggested that the best way to accomplish this is to begin in the schools, and that as apothecaries are often sent to remote stations on the occurrence of a severe outbreak of malaria an opportunity should be given to them to learn how to take blood-films and how to recognise the anopheles and its larvæ. Such a course of study, it is noted, might advantageously be given at Ceylon Medical College. The most interesting points which the report shows may be briefly summarised as follows: (1) malaria at the present time is epidemic in Ceylon only in certain localities; (2) the island contains many anopheletes and the conditions which exist there are peculiarly suitable for their development; (3) a large proportion of the existing anopheletes are not infected with the malarial poison; (4) coolies affected with malaria are constantly being introduced from India to Ceylon. There is, therefore, a possibility that malaria may become more prevalent if these facts are not realised. The mode of spread of the distemper will be this, Coolies suffering from the disease will go to a part of the country which contains healthy anopheletes. The anopheletes by sucking the blood of the infected coolies will become affected, and in their turn will infect men previously free from the malady. Dr. Chalmers is justified in his belief that "anyone suffering from malarial fever in a country in which the anopheles abounds is a danger to public health." In the report this teaching is given as a personal opinion, but it is a fact about which there can be no shadow of a doubt, and Dr. Chalmers rightly founds his recommendations as to prophlaxis on the certainty of its truth.

## COCONUT PLANTING IN BRITISH NORTH BORNEO.

In March of this year I visited a coconut plantation in British North Borneo and took the following notes, which may be of interest to some of your readers. Distance from Sandakan, two hours by steam launch. Six thousand coconut trees planted in 1896, of which 1100 are now in bearing, and the balance will all be in bearing in two years. Judging by the crop now on the trees and the usual yield in the district, the probable crop will be at least 3000 nuts per acre when the trees are in full bearing. Present selling price, $36 per 1000 delivered in Sandakan; present value of dollar about 1s 9d. Arrangements have been made to plant other 9000 trees this year; terms, fifty cents per tree to be paid to the contractors when the trees are three years old, during which time cash advances are to be made to the contractors for food.

Fourteen families were engaged on the new plantings, and when I visited the plantation with the agent he told me no advances had yet been made, although the contractors had been at work some months clearing away the jungle and preparing the land for planting; but on coming away the agent showed me a list of moneys asked for by the contractors amounting in all to $175, or about a sovereign to each contractor. I did not see the new coconut plantings, but I was told that most or all of the new land had been planted, and this was the first advance,

The contractors on this plantation are Philippinos, some of whom migrated to British North Borneo during the late war with America. The contractors are allowed to plant foodstuffs between the coconuts, such as potatoes, yarns, bananas, pineapples. They soon have a stock of poultry, and nearly all the contract money should be in hand at the expiration of the contract time. labour can be obtained in plenty for this kind of work. After the third year the chief work is to keep down the jungle growth, which should not cost more than $3 per acre per year, and in the fourth year cattle may be introduced, and the cost of clearing the jungle will become still less. The great enemy of young coconut trees is the wild pig, but this plantation has not, so far, suffered much. Under the present contract system the loss, if any, during the first three years will fall on the contractors. Where wild pig are plentiful a barbed wire fence seems to be a safeguard against their depredations, which rarely continue after the third year.

I visited the manager's house, situated on the edge of the sea beach, and under the shade of the coconut trees now in bearing—a pleasant, breezy spot. He told me the drinking water was good, fish cheap and plentiful, poultry in plenty, and pigeons of several kinds could be shot. Meat was scarce, as it had to be brought from Sandakan. The manager was leaving, as the heavy work connected with the opening of the now plantation was finished, and the present acreage is too small to afford a European superintendent. I estimated the acreage at 200 acres, allowing seventy-five trees to the acre. The trees were planted too close, and it would be better to pay the contractors a little more and only allow fifty trees to the acre.

A smaller estate than 400 acres should not be attempted, as the living expenses of a European manager would be too heavy on a small acreage. The total cost of planting 400 acres I estimate at £7 to £8 per acre, which expenditure would be extended over seven years. In this estimate I have allowed a very liberal sum for unforeseen contingencies, and I allow £120 to £150 sterling a year for living expenses or salary of the proprietor until the trees come into bearing, after which the salary would probably be about £1 per acre. After the seventh year there should be an appreciable crop. One hears of coconuts bearing in five or six years, but it would be better not to rely on any appreciable crop until after the sixth year, and an average of 3,000 nuts per acre (allowing fifty trees to the acre) would probably not be obtained over the whole plantation until the tenth year, after which a certain amount of manure would be required to maintain this output.

I estimate the profit from 400 acres of coconuts at £2 to £2 10s per acre. The duration of a coconut estate seems to be unlimited. When the trees are worn out new ones are planted. The price of coconuts seems to have been well maintained for the last century. Mr. John Ferguson published in the *Ceylon Observer* about twenty years ago a list of prices obtained in Ceylon for coconuts from the beginning of the century, which showed a steady rise in value, and since 1880 the price of coconuts has risen considerably, partly due to the increasing quantity of soap made from coconut oil, and partly to the demand for coconut kernel in sweetmeats.

Young men with some capital who are willing to devote ten or twelve years to the task would find coconut planting in British North Borneo a very enjoyable out-of-door life, with plenty of leisure and a fairly certain income when the trees come into bearing. Very little knowledge is required by the coconut planter, and that little can be acquired while the trees are growing. The only caution I would offer is as regards selection of land. The prospects of a planter are rendered more favourable if the soil is good, and if labour, communication, and food supplies are duly taken into consideration when selecting the land. A railway has lately been made seventy miles along the west coast of British North Borneo which passes through good land for coconuts, and is being extended thirty-three miles into the interior. I should advise land being taken up in the vicinity of the railway. When the interior line is completed it will be pleasant to go to the hills for a change. Very fine deerstalking can be obtained on the higher level. On the lower levels near the sea snipe abound in season, also wild duck, and, for those who want big game, both wild cattle and rhinoceros are to be had in British North Borneo. Wild elephant exist on the east coast, but a somewhat prohibitive tax of $150 has to be paid for each elephant.

From the foregoing it may be gathered that a coconut planter's life does not entail much hard work. Before the plantation comes into bearing the amount of attention required is not sufficient to fill the time of an able-bodied European, and it would be as well if the proprietor could obtain some additional employment; but when the trees begin to crop, the supervision of the collection of the nuts and their sale, as well as the upkeep of the plantation, would afford a pleasant out-of-door employment, with plenty of leisure.

H. W.

—*Field*, Oct 18.

## THE PEARLING INDUSTRY OF NORTHERN AUSTRALIA.

According to "Australasian Hardware and Machinery" for September, a report on the pearl-shelling industry in Northern Australia has been furnished to the Federal Government by Judge Dashwood, the Commissioner specially appointed for that purpose some time ago. At Port Darwin, according to this report, the industry gives employment to 291 persons, and at Thursday Island to 2,214, or 2,505 in all. Of the owners some 35 are Europeans, but 13 are Torres Strait islanders, while all the drivers are coloured—more or less. The Commissioner is of opinion that, given better wages and conditions of living, white men might be obtained to undertake the work, but he is satisfied that the industry could not be profitably carried on with the increase of expenditure which this would entail. Some time ago the transference of the headquarters from Thursday Island to Merauke, in Dutch New Guinea, was spoken of, but the Commissioner thinks this port would be altogether unsuitable. In 1900 the pearl-shell raised at Thursday Island was valued at 116,697*l*. A report by Mr M S Warton, the resident magistrate at Broome, Western Australia, on the pearling industry in the north-west of that State, has since been laid before the House of Representatives. It confirms Commissioner Dashwood's conclusion that the industry cannot be carried on by white labour alone. In Western Australia, says Mr Warton, 618 persons are engaged in pearl-shelling, of whom only 110 are white men. As indicating the value of the trade to the Commonwealth, it is shown that from the fleets engaged in collecting pearls 20,000*l* is paid yearly in Custom's duties.—*Board of Trade Journal*, Oct. 23.

## MICA MINING IN INDIA.

A very acceptable volume on the subject of the Mica Deposits of India, written by Mr T H Holland and published in continuation of the series of memoirs of the Geological Survey of India, has just been issued. It is of a far more entertaining character than have been many of its predecessors; and the writer has not scrupled in his descriptions of the mica mining industry to be as interesting as if the volume were not a scientific treatise, The primary object of the work is to

describe the Indian occurences of mica commercially valuable, and of course this only implies a very limited area. Mr Holland points out that such an area must necessarily be restricted in extent as the combinations of circumstances necessary for the formation of mica-crystals of the proper size and without the flaws commonly produced by earth movements are always restricted in extent. I therefore follows that large mica deposits are commercially very valuable to the country which possesses them, and according to Mr Holland India possesses an area which should give her a good share of world's trade in mica, and at any rate should make mica mining of far more importance than it is at present. Mica appears to have been used in India in the past very extensively as medicine, it was considered to have magical as well as medicinal properties. Of conrse it is now used in India principally in the manufacture of ornaments. But mica is being largely used in other directions abroad, and as has been mentioned is a valuable commercial asset to any oountry. Mr Holland therefore mentions that it would not be very surprising if Government were to show an inclination to temper the encouragement already given to the mica miner with restrictions intended to discourage his wasteful methods of mining and the tendency which he has shown, not unnaturally, to secure immediate returns by want only excavating shallow workings over large areas. The paper is also intended to convey to the mica miner a brief resume of the nature and history of the mineral in which he is so largely interested. It is rather doubtful, however, whether the book will ever find its way to those who follow the industry and if it do whether Mr Holland's erudite discursion on the minerological and chemical characters of the mineral will be properly understood and appreciated. The mica deposits of India appear to be fairly widely distributed. The Tibet border, the Bombay Presidency, Burma, Central India, and the Central Provinces, Madras, and Mysore, the Punjab, and Rajputana, all claim valuable mica quarries, and there is not the slightest doubt that properly worked and safeguarded the mica mining industry could be developed to a far greater extent than it is at the present time. Considering that mica is now so largely used in the electrical industry exportations of the mineral would doubtless be heavy and profitable. Although the volume contains a good deal of information that will be of use in the industry itself, it is chiefly a mineralogical record, and as such it is complete and satisfactory.—*Bombay Gazette*, Oct. 6.

## THE TEA BONDED WAREHOUSE RING.

A correspondent of the *Financial News* of October 28 writes :—"Allow me to add my testimony to the excessive charges made by the warehouses on the unfortunate tea Importer. Following the lines of your correspondent, 'An Indian Tea Planter,) in your issue of the 17th instant, here are the disbursements of an Indian tea garden for freight and warehouse charges, as well as the amount and value of the tea grown for the past two years :—

| | Tea sold. | | Freight. | | Wareho. Chs. | |
|---|---|---|---|---|---|---|
| Year. | Lb. | Value. | Amt. | p. c. | Amt. | p. c. |
| | | £ | £ | | £ | |
| 1901 | 90,614 | 3,171 | 135 | 4 25 | 165 | 5·20 |
| 1900 | 141,826 | 4,360 | 243 | 5·57 | 220 | 5·04 |

"The number of chests for 1901 was 1,087 and for 1900 1,455, being a total of 2,542. You will observe that the statement of your Calcutta correspondent, that he was told that the warehouse charges are often equal to the cost per case of conveying tea from Calcutta to London, is amply borne out by the above figures, where for 1900 the ware house charges amounted to 5·20 per cent of the value of tea, as against 4·25 per cent paid for freight.

This, however, is not the only grievance of which the importer has to complain in regard to these charges, though whether the warehouse proprietors are responsible for it I cannot say. The importer, before he can obtain possession of his tea, has to pay through his broker the charges for freight and warehousing, which, of course, no one complains of ; but when he comes to receive his account sales he finds that he is charged, in addition, interest at 5 per cent for three months on both charges ; so that on the above sums, amounting for the two years to £763, he is mulcted to the tune of over £10. One would naturally suppose that if these charges did not fall due for three months the importers should receive, and not pay interest. But it is 'the custom of the trade' one is told, and has meekly to submit. Again, should the importers wish to delay receiving the proceeds of the sale until prompt date—viz., three months—'the custom of the trade' comes in, and he is forced to take a cheque, less three months interest at 5 per cent, and which he has to deposit with his bankers, who will barely give him 3 per cent for it.

"Take, besides these iniquitous warehouse charges and the others already referred to, those for brokerage, agency, and miscellaneous, and can it be wondered at if the lot of the tea planter, with the price at 5½d—6d per pound, is at the present time not a particularly happy one ? To make one's meaning perfectly clear, copy of pro forma account sales is appended :—

ACCOUNT SALES OF TEA, &c.

| | | |
|---|---|---|
| 80 Chests, 5,840 lb.—6d .. .. | | £146 0 0 |
| CHARGES. | | |
| Freight—33/9 .. | £10 15 4 | |
| Warehouse charges .. | 12 0 6 | |
| Public sale, 14 lots .. | 0 10 6 | |
| Int. on frt. 20/7—6/11, 110 ds. .. | 0 3 5 | |
| Do warehouse, &c. 12. 11/, 90 ds. .. | 0 3 2 | |
| Brokerage 1 per cent... | 1 9 2 | |
| | | 25 2 1 |
| | | £120 17 11 |
| 91 days disct. .. .. | | 1 10 3 |
| | | £119 7 8 |

—*Home and Colonial Mail*, Oct. 24.

## AGRICULTURE IN CEYLON :

(In connection with subjects treated of in the "Agricultural Magazine.")

### IRRIGATION

has done much for Ceylon. It has changed Anuradhapura, or rather the North-Central Province, from a howling, fever and parangi-stricken wilderness, into a fertile, smiling garden. It has done and is doing the same in other neglected parts of this island. In spite of Mr. Digby, it is doing much on the opposite continent to minimise the effects of recurring famines.

Now South Africa has come under British Rule, the attention of its administrators has been turned to irrigation. Mr. Willcocks, C.M.G., M.I.C.E., has reported to Lord Milner that on irrigation, and irrigation alone will depend the permanent development of the country. Agriculture is neglected for gold and diamond mining and is, what it was fifty

years ago. It is primitive; and farmers move from the highlands to the lowlands and *vice versa* with the seasons. The necessity for irrigation is accentuated by the fact tbat the rainfall is uncertain and erratic. Water must be stored during the season of heavy rainfall, for use when the seasons are dry. Mr. Willcocks has experience of irrigation in India and in Egypt, and speaks of the "immense benefits" derived from irrigation in those countries. He makes a novel suggestion to raise the necessary funds for irrigation works. The mine-owners should be compelled by laud to devote a percentage of their profits towards the execution of irrigation works, so that when the mines are exhausted, the country may not drop from the "height of prosperity to the depths of poverty"!

BETEL CULTIVATION

is carried on all over the island, but on a large scale, only in certain villages. Along over the main line of railway, the hulk of the traffic in betel leaves, is from Mahara and Henaratgoda. Why this is so, I cannot say. It may be that the soil of these villages is peculiarly suited for its cultivation. It is known to be a very paying crop, and a small plot of land planted with these vines is known to yield quite a respectable income. I doubt, however, whether the local yield can equal the reported yield in the Madras Presidency, which is said to be at the end of the first year R30 per acre per mensem. The vines in the island are trained on dead wood and are closely planted. In Madras, they are trained on "Katurn Murunga" trees, which are first planted on the land. The vines are evidently very carefully tended and cultivated in India, for it is said that they receive half-yearly supplies of annual revenno and the delicate vines are fed with milk! In the island, the only mannre used is, I believe, the leaves of the "Keppetiya."

"THE PROPER METHOD OF PLANTING TREES"

is a very useful and instructive article. It is written by Mr. A. Despeissis, of Western Australia and refers to the planting of orchards. However, there are many hints in it which will be useful to all classes of planters in the island. Holes should he wide enough to admit of the spread of the roots—the wider the better. Coconut planters take special note of this, especially those planting on stiff soils. A very good method of securing wide holes, is to fill them by cutting the surface soil all ronnd them. By this means, a 3 in. by 3 in. hole nearly doubles itself. Where the sub-soil is stiff, it is said the holes should not be deeper than the free surface soil, else the hole acts as a hasin for the retention of water and the roots of the plants rot and they die. One of the most troublesome of planting operations, is to plant in straight lines. It is difficult enough to line straight, but in cutting and filling the holes, the pegs are displaced and in planting, subsequently, the lines are hopelessly destroyed. A method is suggested for placing a plant exactly where the peg was, which, unfortunately, will not be found practicable on tea plantations, except at a prohibitive cost. The zig-zagging of the lines of a tea estate, are not very apparent owing to the formation of the bushes, but breaks in the lines of

COCONUT

trees, are an abomination and an eye-sore. The method suggested is to take a loug narrow plant and cut a V shaped notch in the centre and at each end. Place the plant on the ground with the peg at the centre notch. Drive pegs deep into the ground at each notch at the ends of the plant, remove the centre peg and cut the hole to the required dimensions. When planting, place the plant on the ground so that the notches at the ends will fit into the pegs on the ground, and place the plant where the centre notch is, which will be the exact spot where the living peg was originally. All this may be slow and tedious, but it will ensure good work, and whatever is worth doing, is worth doing well.

For a hard impenetrable soil, as is occasionally met with on the cabook hillocks of

COCONUT PLANTATIONS,

it is suggested that the bottom of tho hole should be shattered with dynamite or blasting powder. Crevices aro formed which permits of the free passage of water and of roots. An idea is very prevalent amongst coconut planters, that placing the plants deep down in the holes is the perfection of planting. The evils of this system are seen in seasons of wet, when it becomes necessary to remove the plants from the holes, and plant them outside, to prevent their dying off. My system has always been to fill up the holes to within one-foot at the outside from the surface, however deep they may have been cut. This writer deprecates deep planting for the same reasons that I hold.

According to a lecture hy Mr Orpen, the head of the Agricultural Department at Rhodesia, the

CHENA CROPS

in that country are similar to those in India and Ceylon. The crops are

INDIAN CORN, KURAKKAN

and what is called *kambu* in India. The first is consumed in the form of meal converted into porridge or hread and beer. For long journeys, the corn is parched or "sprung." In this form, it is called "porri" here and is always to be seen rendered by "kadala," or parched gram, women. The "sprung" corn ground and mixed with a little salt forms the rations of native soldiers on the ward. In a six weeks' march against Langahalele in 1873, the native soldiers were provided with the meal of parched corn and were able to perform the march successfully on this nutritions diet.

"KURAKKAN"

is supposed to be the most nitrogenous of farinaceous grains. The natives consider it more nutritious and satisfying than other grain. The same opinion obtains in the Wannie and other interior districts of this Island. A villager will, by preference, have a meal of kurakkan to one of rice. It is more satisfying, possibly owing to its indigestibility. He says he can go for a whole day on a meal of kurakkan, while before half-a-day is over, he grows hungry on a meal of rice. It is eaten in the form of "pittu" with scraped coconut, or boilt and made into large pills, dipped into curry gravy and pushed down the throat. Mixed with honey, it is made into "halapa." Ceylon has not as yet developed a trade in the export of its fruit. Perhaps time will help in the development of this trade, and a few notes on the packing of fruit for export, will be useful. The first requisite for the successful transit of fruit is careful picking. Fruit should not be allowed to drop on the ground and be injured. They should not he packed immediately after picking, but should be laid out for a few days to "harden" and for the superfluous moisture of the skin to dry up. In transit, *cold* chambers destroy the flavour. Cool, ventilated chambers are necessary. It is best that each layer of fruit should have a separate chamber, or in large cases, such as barrels, the lower layers of fruit, have to hear the weight of every thing above them. Valuable and large fruit, should have a compartment for each. Mangoes for export should not be picked ripe, but when "full" and ripening during transit.

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GUATEMALA COFFEE CROP DESTROYED.—A San Francisco firm which is interested in the coffee business in Guatemala has received a cablegram, states Reuter, from its representative in that country stating that the entire coffee zone has been destroyed by the recent volcanic disturbances, and that enormous losses have been sustained. The eruption of Santa Maria continues. The coffee plantations are buried beneath several feet of sand and ashes.—*Westminster Budget*, Oct. 31.

## TEA BUG OF ASSAM.

### A DISPUTED POINT.

Mr H Harold H Mann, B Sc., contributes the following notes :—As is well-known *Helopeltis theivora.* "Tea Bug of Assam" as it was called by Mr Wood-Mason, the "Mosquito Blight" as it is generally termed—is the most alarming pest which has yet appeared on tea cultivated in India. It causes the more disquietude as it tends to increase as years go by,—fluctuating according to season, but generally increasing and invading new areas. During 1901, which was a particularly bad year in almost all districts subject to the pest, a very moderate estimate gives seven lakhs of rupees as the nett loss to the Indian Tea Industry from this cause alone.

Though we have a knowledge, thanks to Peal, Wood-Mason, Dudgeon, Watt and Green, of the general life-history of the insect from the egg to the adult stage, yet there remain several points which have been very obscure. Of these the most important is the question as to what becomes of the insect during the time when it apparently disappears from the tea bush. So complete is this disappearance, as a rule, that most planters living in affected districts in North-East India have hardly ever seen a single insect during January, February and March. Mr Dudgeon has suggested that it hibernates in the ground, but offers no evidence for his position, and declares frankly that he had not been able to verify his conjecture. It has also been supposed that hibernation takes place in water and swamps, but again, not a scrap of evidence in favour of the view exists, and the same may be said of the very general idea among tea planters that in the cold weather the *Helopeltis* goes on to various jungle trees.

With a view of acquiring information on this point, I have spent a considerable time in January, February and March of the present year in two of the districts most affected by the pest—Darjeeling-Terai, and Cachar—at a period when the insect was supposed to be hibernating. As a result I have come to conclusions, of which the following is a summary. The *Helopeltis theivora* can be found on the tea bush in every stage of development during every period of the year. The cold weather kills off the bulk of the mature insects and practically all the larvæ, but at all times sufficient remain to carry on the pest to the next season, and in addition the bushes are full of eggs. These latter were found not only in the usual position on the young shoot, but also at a much lower part of the bush than had previously been noticed embedded in the usual fashion in the mid rib of the large mature leaves. The larvae were found on 11th January in small numbers on unpruned and sheltered bushes, then forming about 2 per cent of the total number of insect caught. By 12th February, however, a very different proportion of adults and larvæ were obtained, and now instead of 2½ per cent the larvæ formed 80 per cent of the total catch. This proportion was approximately kept up during several weeks from that date. The difficulty in obtaining evidence of their presence at this time is due to their attacking almost entirely the slightly shaded young leaves, the surface growth being rarely injured in the early part of the year.

The insect could further not be found on any jungle plant at this time. Though jungle of very miscellaneous character was systematically searched both by myself and by the children who are regularly catching the insects and who are extremely expert at the work, not a single one was discovered in any form.

It appears, therefore, evident that there is from present knowledge no need to assume a hibernating stage at all for *Helopeltis theivora,* and that the insects remain and can be found in every stage of growth from the egg to the mature female full of eggs in the tea-bush, at all times of the year. Whether the egg found low down in the bush, as described above can be considered as a special hibernating egg, I can hardly say, but there certainly was no difference in structure or in method of deposition from that usual during the regular season. Inasmuch, then as there is absolutely *no* evidence of the cold weather being passed by the insect in the soil, in water, or on other trees, and furthermore, as careful observation can always detect the insects and their eggs on tea bushes in affected districts, their is no need to imagine any hybernation stage at all in India, and beyond a certain retardation in development due to the reduced temperature, the reproduction of the insect may be considered to take place in a similar manner throughout the year, and to be carried out on the tea bush itself during the whole period. These observations have a practical interest, and may lead to a sound method of attempting to deal with the pest, and experiments in this direction are now in progress.—*Indian Daily News,* Nov. 10.

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## THE LONDON CIRCULAR ON THE TEA CESS.

Dear Sir,—I am instructed by the Tea and Produce Committee of this Association to hand you the enclosed copy of a letter, dated 22nd September, 1902, from Mr A C Kingsford, Chairman of the Planters' Association of Ceylon, embodying a resolution of the Thirty Committee, dated 13th September, 1902, and to ask whether you are prepared, on behalf of the interests that you represent, to agree to the proposed increase of the Tea Cess from 30 cents to 50 cents per 100 lb.

I am further instructed to invite an expression of your opinion generally, and any suggestions you may have to make, as to the appropriation of the funds at the disposal of the "Thirty Committee."

At a meeting of the Tea and Produce Committee, held on the 22nd October, the following resolutions were passed, and are communicated for your information :—

1st.—"That, while the Committee approve of the encouragement given to the Green Tea industry, they do not consider it necessary or desirable at the present moment to increase the Cess as recommended by the 'Thirty Committee.'"

2nd.—That the following suggestions put forward by Mr Rutherford meet with their approval:—"That the 'Thirty Committee' guarantee 4 cents per lb. bonus on 7,000,000 lb. of green tea out of the 1903 Cess, which it is proposed should not be increased over its present rate, and in the event of there being insufficient funds from which to pay a bonus on green tea exported in 1903 in excess of 7,000,000, then the payment of the bonus of 4 cents on such excess quantity shall be a first charge on the unexpended balances for advertising, etc., and on the Cess of the following year."

Answers to this circular should be sent in on or before the 10th November, 1902.—I am, dear sir, yours faithfully,

Wm. Martin Leake, Secretary.

61 and 62, Gracechurch Street, London, E. C., 27th October, 1902.

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## PROTECTION OF BUILDINGS AGAINST LIGHTNING.

There is a subject of great interest to people out here, as elsewhere, says "Max" in *Capital* of 30th ultimo, and that is how best to protect their buildings against destruction by lightning. The question has been discussed over and over again. I remember a good many years ago the London *Times* opened its columns to a lengthened correspondence on the point as to whether the

ordinary lightning rod which is considered so essential to all our chimney stalks and church steeples, and which appears to be so highly resented by the cock on the top of the Scotch Kirk in Calcutta as interfering with the dignity of his environment, was really of any use as a protection against destruction by lightning. At the end of that discussion, in which many experts took part, the balance of evidence inclined towards the opinion that the ordinary lightning conductor was really of very little use for the purpose for which it was erected, and that very often it was a positive danger to the building. Since then the "lightning rod" question has often cropped up for discussion, and always some little contribution to our knowledge on the subject, mainly gained by observation and experience, has been added. Again, I see there is a discussion going on, and a new generation is anxiously asking what engineers have to say on the best methods of protecting buildings from destruction by what we call lightning. *The Scientific American* says: "The rod should traverse the edges and peaks of the roof and the lower parts should go to the ground at all the corners of the building for best protection." The terminal points must go to wet earth, or into a well if one is handy. This looks like, not one rod, but a complete network or cage of rods. The journal above quoted also states that no insulators should be used on the rod. So far, *The Scientific American*. And now come the conclusions of a number of scientific men who formed themselves into a Lightning Research Committee, and which seem to bear out the American opinion. After nearly a year's investigation, these scientists found the old theory of the protective value of a single road on a church steeple or tall chimney completely exploded. They found that lightning often struck a building and committed damage within a few feet of the conductor. The conclusion arrived at was that if a thorough protection of a building is possible, it can only be effected by a network of protectors spread over or around the building, and with many earth connections. It would be interesting to have the views of the chiefs of the Indian P W D on this subject, and it may be as well for all those who are living at ease under their old fashioned lightning rods to bestir themselves, and get into copper cages at once. All the unsightly single lightning rods that disfigure our public buildings may as well come down, in view of the proved fact that they are not only absolutely useless but may turn out to be sources of positive danger.

## THE CAMPHOR INDUSTRY OF FORMOSA.

The camphor factory at Taikwakan, one of the two most promising camphor districts near Taipeh, had to be closed the year before last (says the (*Kobe Chronicle*) on account of the havoc wrought among the trees by the aborigines. The same course had to be taken at Nansho a few months ago, and this factory has also discontinued business. We now learn from the vernacular paper that it has been arranged to start the manufacture of camphor at Taikoyo, near Gilan, and that charters have been granted to the Komotsugumi and other firms. The yield of camphor during the present fiscal year at Taikoyo will, it is estimated amount to about 360,000 catties. Preparations for the new station are now being pushed forward.—*Overland China Mail*, Oct. 25.

## JAVA CINCHONA AND QUININE.

Notwithstanding the increased monthly shipment of cinchona bark from Java to Holland during 1901, prices realised were satisfactory. At the auctions in Holland the unit price rose from 7·25c in January to 10·45c in June, only, however, to recede to 7·65c in December. The average unit price was 8·30c for the ten auctions held, and the average percentage of quinine in the bark was 5·45 per cent. The equivalents of above quotations in sterling are:—

| Currency. Cents. | Sterling. d. |
|---|---|
| 7·25 | 1·45 |
| 10·45 | 2·09 |
| 7·65 | 1·53 |
| 8·30 | 1·66 |

The exports of bark from Java during last year compared with those of the four previous years are as follows:—

| Year. | Quantity. lb. |
|---|---|
| 1901 ... ... ... | 13,901,586 |
| 1900 ... ... ... | 12,068,718 |
| 1899 ... ... ... | 12,414,402 |
| 1898 ... ... ... | 12,123,310 |
| 1897 ... ... ... | 8,498,726 |

The quantity of sulphate of quinine produced by the Bandong factory and sold at auction in Batavia during 1901 was 1,014,000 oz. (English). The average price paid was 1 1-10d per oz., the equivalent of 1 7-10d per unit. The bulk of the quinine was shipped to the United States and London. Some parcels were also forwarded to Australia, British India, China, Japan, and the Straits Settlements.

The following are particulars of quantities sold and average prices realised at Batavia auctions last year:—

| Date of Sale. | Quantity in oz. | Average price per oz. |
|---|---|---|
| February 27 ... ... | 120,000 | 11·67 pence |
| April 3 ... ... | 108,000 | 12·88 " |
| May 15 ... ... | 104,100 | 13·52 " |
| June 19 ... ... | 96,100 | 13·32 " |
| July 24 ... ... | 84,400 | 12·21 " |
| September 5 ... ... | 62,000 | 11·34 " |
| October 9 ... ... | 111,300 | 11·66 " |
| November 13 ... ... | 183,400 | 11·34 " |
| December 18 ... ... | 144,000 | 11·44 " |

—*Tea*.

## A NEW SYNTHETICAL GUTTA-PERCHA.

I thought we should not have to wait long. There has been such a lot of artificial, synthetical, and other wondrous kinds of rubber announced to the world that it is only fair that gutta-percha should at last have a look in. And it has got it. The "Electrical Review" tells us that "synthetical" gutta is an accomplished fact. But if anyone standing outside the rubber industry wishes to see what a farrago of nonsense and ignorance is looked upon as information to the rubber trade, and, alas, others besides he should peruse that article—and ponder.

That this artificial preparation is capable of replacing gutta-percha for insulating purposes, even for submarine lines, is by no means impossible, but it will take several years' practical test to establish beyond doubt the stability of this new preparation. On this point it is difficult to prophecy without even knowing the constituents of the new Gutta. All that can be said is that this stability will be determined by that of its most

unstable constituent, and as soon as this is known we shall be better placed for making a forecast.—*India-Rubber Trades' Journal*, Oct. 27.

## HORNSBY-AKROYD OIL ENGINE.

We think the facts set forth in the advertisement of this oil engine are of sufficient importance to merit calling special attention to the same; for, we are told that "it has now been demonstrated without doubt, that the 'power-bill' for the whole of the island could, on a very conservative estimate, be reduced by one half, by using liquid fuel in a Hornsby-Akroyd Oil Engine." No doubt there are other "Oil Engines" which also show capital results according to the testimonials advertised to the value of "Campbell's," "Cundall's," "Clayton and Shuttleworth's," &c. The great matter is the economic gain by using liquid fuel.

## PLANTING NOTES.

THE VINEGAR CURE.—"D C S" writes to the *Madras Mail* :—One of my chaprasis, whilst leaning up against a door post, suddenly jumped with a shout and then almost doubled himself up nursing his leg and groaning that the pain was shooting up to the top of his thigh. The cause of all this bother was discovered in the shape of a vigorous young scorpion which had landed its symmetrical sting in the calf of the chaprasis's leg, I almost at once had the calt well rubbed with vinegar, and in a very little while afterwards the chaprasi looked up with a beaming smile on his face and, much to the gratification of the other servants who were looking on, remarked to me :—"*Sirkah babut atcha dawai Sahib.*" He was up and attending to his work in 20 or 30 minutes time as if nothing whatever had happened.

GOLD, GOLD EVERYWHERE !—Here is a bit of a warning for Sir West Ridgeway and any others who may expect to find paying gold deposits in Ceylon. In the *Empire Review* for November, "T. B.," writing from the Gold Coast, West Africa, says :—

"The colony, of course, can claim to be a gold-bearing country, and in my opinion and many others, that is all that can be said for it. Every yard of it I believe to be gold-bearing, but it is so fine and well distributed that it is well-nigh impossible to collect it ; you can take a bit of float quartz from almost any part and get a colour from it, but still no reef has been found above water-level, and water-level is no great depth in this country (averages 100 feet) and no indications in leaders to denote better gold below. I am speaking from experience (from sinking shafts, striking leaders and following and from adit levels with 100 feet of backs), also I am situated so as to come in contact with some of the most prominent engineers that have been engaged in reporting on properties in West Africa. Nothing sensational has been met and certainly nothing is expected in that line. As things stand at present so much capital has been thrown into the country that companies are in duty bound to spend more till they get decided reports on their ventures ; read what papers you will, in none can you find a report giving satisfaction or proving by the value of the mine. Promises, yes, by the score, but nothing tangible, and I do not think there ever will be."

A GOLD CURRENCY.—There are bankers in our midst who decidedly prefer gold as a currency if only there was silver to back it ; and no wonder—for one small package of gold will bring as much value, as 25 packages with 3 lakhs of rupees. Think of the extra trouble and cost in counting and packing, in freight, in delivery, in checking, etc., etc. !

"THE COARSER PRODUCT OF INDIA AND CEYLON" !—The *North China Herald* (October 1st) commenting on the report on the trade of Hankow "the future Chicago of China" says :—The gross value of the trade, in spite of a short tea crop and a serious falling-off in shipments of the leaf, "falls little short of the value for 1899 when the highest figures recorded for any year were reached. The business in black tea showed a considerable decline, but there was a marked recovery in the export of brick and tablet tea. When tea was the great staple of Hankow, and the British public had not been led away by its cheapness and strength to prefer the coarser product of India and Ceylon, the trade of Hankow was mainly in British hands; what was then known as "muck and truck" now bulks very largely in Hankow's exports, and it seems that Continental buyers can pay better prices than their British competitors for the hides, nutgalls, wood oil, vegetable and animal tallow, bristles, skins, sesamum seed, etc., which make up the deficiency caused by the decline in the demand for China tea.

CULTIVATION OF SUNFLOWERS.—The first year of the twentieth century closed with a curious sale, at the Baltic sales-room, of a cargo of Sunflower seeds, which changed hands at £11 5s per ton. Though a small trade has been done in Sunflower seeds for nearly 200 years, this transaction was the first in which a whole cargo—300 tons sent from Odessa—was dealt with. In Russia, where the cultivation of the Sunflower and the manufacture of oil from its seed is conducted on a large scale, the variety grandiflora is the one grown. The species rises in a slender stalk of 5 feet high, producing one monster head, the average yield being as much as 50 bushels of seed to the acre. So rich is it in oil, that that quantity of seed will yield 50 gallons of oil ; while the refuse of the seed, after this quantity of oil has been expressed, weighs 1,500 lb. when made into cattle cakes. Few people in England who grow the Sunflower for ornament have any idea of its usefulness. It is among neglected crops in which there is money. Besides the seed, every other portion of the plant can be utilised. The leaves furnish an excellent fodder ; while in Russia the stalks are prized as fuel, and their ashes, which contain 10 per cent. of potash, are readily sold to the soap-makers. Naturally in Russia the chief virtue of the Sunflower lies in the oil contained in its seed. The oil is of a clear, pale yellow colour, almost inodorous, and of an agreeable mild taste, so that it is in great request as a table article. Why Sunflowers are not cultivated on an extensive scale in England, it is difficult to say. Poultry and cattle like the seed, either in its natural state or crushed and made into cakes. No plant produces such fine honey and wax ; when the flower is in bloom, the bees abound in it.—*Journal of the Department of Agriculture of Western Australia.*

TO THE PLANTING WORLD.

# Seeds & Plants of Commercial Products.

**Hevea Brasiliensis.**—Orders being booked for the coming crop August-September delivery 1902, booking necessary before the end of April, quantities of 100,000 and over at special low rates. Plants available all the year round, 100,000 and over at special low rates. A leading Rubber planter in Sumatra, who purchased 50,000 seeds in 1899, and 100,000 in 1900, writes us, under date 15th November, 1900:—"I received your letter of 20th October, from which I learn that you added another case of 5,000 seeds to replace the loss, &c. I am satisfied hereby, and even after this adding I am satisfied by the whole delivery of this year." Special offer, post free on application.

**Castilloa Elastica.**—True superior variety cultivated in Mexico, seeds from specially reserved old untapped trees. Orders booked for August-September delivery 1902, immediate booking necessary; large quantities on special terms; Plants in Wardian cases.

A foreign firm of Planters writes under date 11th October, 1901:—"We beg to enquire whether you would procure us 100,000 Castilloa seeds, in which month we might expect them, and what would be the average price." Special offer, post free on application.

**Manihot Glaziovii.**—Seeds and Plants available all the year round, 100,000 and over at special low rates. A Mexican planter in sending an order for this seed wrote on the 22nd August, 1900:—"If they arrive fresh and germinate easily I may send you larger orders, as they are for high ground where the Castilloa does not thrive."

**Ficus Elastica.**—Seeds available in May-June; booking necessary before the end of March; also plants.

**Mimusops Globosa** (Balata) wood of the tree is much sought for buildings, fruits sweet like a plum and eaten, oil from seeds, said to yield as much as 45 lbs. of dry rubber per tree per annum, the milk is drunk and when diluted with water used as cow's milk, grow from-sea-level up to 2,000 feet, orders being booked for seeds and plants, price on application.

**Cinnamomum Zeylanicum** (Cinnamon superior variety).—New crop of seed in April to June; booki ngnecessary before the end of February, also plants.

**Coffee Arabica, Liberian Hybrid** and **Maragogopie Hybrid.**—New crop March-April; immediate booking necessary.

A foreign Agricultural Department writes dating 9th September, 1901:—"Please accept our order for 175 lbs. of Tea seed and for 2,000 Coffee beans. In regard to Coffee seed I would say that this will be the first importation made by this department, and we will leave the selection of the varieties to be sent to your judgment."

## OUR DESCRIPTIVE PRICE LISTS.

The following six Descriptive Price Lists are now being forwarded with Circulars and special offer of Seeds and Plants of Rubber and other Economic Products:—

1. Tropical Seeds and Plants of Commercial Products, enlarged edition for 1902.
2. Seeds and Plants of Shade, Timber, Wind-Belts, Fuel and Ornamental Trees, Trees for Roadsides, Parks, Open Spaces, Pasture Lands, Avenues, Hedges, and for planting among crops (Tea, Coffee, Cacao, Cardamoms, &c.)
3. Seeds and Plants of Tropical Fruit Trees including Mango grafts.
4. Bulbs, Tubers and Yams.
5. Orchids—Ceylon and Indian.
6. Seeds and Plants of Palms, Calamus, Pandanus, Cycads, Tree and other Ferns, Crotons, Roses, Dracinas, Shrubs and Creepers.

**Special Arrangements** made with foreign Governments, Botanical and Agricultural Departments, Planters and others for supplying seeds and plants of Commercial Products in large quantities.

"South Africa."—The great authority on South African affairs of 25th March, 1899, says:—"An interesting Catalogue reaches us from the East. It is issued by William Brothers, Tropical Seed Merchants of Henaratgoda, Ceylon, and schedules all the useful and beautiful plants which will thrive in tropical and semi-tropical regions. We fancy Messrs. Williams should do good business, for now that the great Powers have grabbed all the waste places of the earth, they must turn to and prove that they were worth the grabbing. We recommend the great Powers and Concessionaries under them to go to William Brothers."

*Agents in London:*—Messrs. P. W. WOOLLEY & Co., 90, Lower Thames Street.

*Agent in Colombo, Ceylon:*—E. B. CREASY, Esq.

*Agent in British Central Africa:*—T. H. LLOYD, Esq., Blantyre.

*Telegraphic Address:*
William, Henaratgoda, Ceylon.
Liber's, A.I. and A.B.C. Cdes used.

J. P. WILLIAM & BROTHERS,
*Tropical Seed Merchants,*
Henaratgoda, Ceylon.

# Correspondence.

*To the Editor.*

## DIFFERENT EUCALYPTI (GUM TREES.)

Botanic Gardens, Sydney, Oct. 2.

Dear Sir,—Noticing a remark in your Journal for September, page 196, I beg to inform you that the botanical name of the Tuart is *Eucalyptus gomphocephala* D.C. and that of the Crimson Flowering Gum is *E ficifolia*, F.V.M.—Yours faithfully,

J. H. MAIDEN, Director.

## A NEW REMEDY FOR MALARIAL FEVER.

London, Oct. 8.

Dear Mr. Editor,—In looking over the *Tropical Agriculturist* of the 1st September, I read on page 188 that "Brucca Sumatranæ is said to be as much a specific for dysentery as quinine is for malaria." This is no compliment to the drug because it is well-known now that quinine is not the medicine to take for malaria, and it is being abandoned in all parts where it is possible to obtain the extract made from Cassia Beareana. This remedy has been tried by hospitals in the United States, after reading the interesting account of the cure that this plant effects when it attacks the blackwater fever. From your remark I should think that you had not seen the book I am enclosing herewith, which is a republication from the "Lancet," and some remarks by Mr. Holmes appended.

Men are going out now to the East and West Coasts of Africa and also to Central Africa, with supplies of this drug, because they do not now dread attacks of this severe form of malarial fever, known as blackwater fever.

One doctor from the United States reports that one of his patients was attacked on the 16th May, 1902. He took quinine sulph. 8 grains on Friday, the 16th May and had a subsequent attack. He then took Cassia Beareana 30 drops in water every two hours, taking 1 oz or a little more altogether. He had no subsequent attacks. The blood was examined on the 16th May, 1902, and contained the tertian parasite; on May 21st it was examined again and there was no sign of any organism. This shows how thoroughly the drug does its work.

If you know of anyone who would like to make experiments with this remedy, we should be pleased to send some if they are unable to obtain it out there.—Yours truly,

THO. CHRISTY.

## GREEN TEAS.

London, Oct. 8.

Sir.—I am pleased to see much more attention given in the direction of making "greens," if only the proper class of greens could be turned out. In London it would appear that a large quantity could be placed if Ceylon arrived anywhere near the class of China greens asked for.—*Colouring greens*: now is it to be checked is the question put The "Thirty Committee" should take up this. and endeavour to arrive at some method of check, as *to colour* tea bids farewell to Ceylon's boast of *Pure Ceylon Tea.* "TEA."

## CACAO IN 1877 AND 1902: A Leaf from the Past.

Among old papers we came across the following letter never published before:—

Gang Warily Estate, Gampola, Oct. 16, 1877.

Dear Sir,—I enclose for the benefit of the readers of the *Observer*, and more particularly for those who are taking an interest in the advancement of the Cacao cultivation enterprise, some valuable information received from Home in the shape of an extract from the "Journal of Applied Science" for 1874,—a *multum in parvo* of all that relates to the cultivation and preparation of Cacao for the market. As this new product is exciting, and, I think, deservedly so, a good deal of attention at present in the Spicy Isle, the matter embodied in sheets sent, seems to me to be particularly applicable to its growth in Ceylon. As the enclosed is a copy of a copy some errors may have crept in, but, I daresay, they will be immaterial. I trust Sir James Longden will take an interest in this new industry in which his past experience would be sure to be a valuable help and guide to intending pioneers, and with a little encouragement from Government in the way of supplying plants of the most approved kinds, etc., a creditable future for this fine plant and excellent beverage may be safely predicted. There may be failures at first—but, if at first you don't succeed, why just "try, try, try again"!—Yours truly,

CA' CANNY.

[Referring the above to the writer, it has brought us the following very interesting reminiscences.—Ed. *T.A.*

Dolosbage, Oct. 16, 1902.

Dear Mr. Editor,—I was much interested in reading my old letter bearing date, 16th October, 1877, exactly a quarter of a century ago, and it recalled to my recollection all the early anticipations and struggles with this grand product. What sanguine estimates we used to frame, when Old King Coffee gave us the go-bye, of the new products which, we hoped, would take its place—Cinchona, Liberian Coffee, etc.—gone, gone, are all the old imaginary figures. How nice they looked on paper; but they may have served a purpose in keeping up one's spirits during troublous times. Even "Queen" Tea looks as if she were going to follow suit!

I think you will find by turning up old *Observers* that I was one of the first to call attention to cacao as worthy of cultivation. Hearing that there were old cacao trees on Pallekelly estate, I made a special visit there. I forget the date. but it shows it was an early one for the old trees I saw were in a neglected sort of state, and the late Mr. R B Tytler was not then very enthusiastic about its cultivation on a large scale.

The cacao article from the "Journal of Applied Science," I have carefully read over, and consider its matter good; but, of course, modifications must be made* when adapting it to the state of things

* Much that has been written in our *Tropical Agriculturist* and in Mr. Hart's useful little book has placed the article of 28 years ago out of date. —Ed. *T.A.*

in this beautiful Isle of the sea. I have no special remarks to make on cacao generally. There are younger and more up-to-date cacao planters now in the field who would be able to give you more information than I can. After 1896 I had personally little to do with it. Up to about that time I got fair yields from my place, and very good prices. Then the price went down with a run and cacao had to take a back seat. Tea was all the go, and chief favourite, and no wonder, seeing that it was more easily dealt with in planting, preparation, freedom from pests, and as giving quicker and better returns.

I consider this climate rather wet. My cacao elevation is from (say) 1,600 to 2,000 feet above sea level. My oldest trees were planted (with a view to extended cultivation) in November 1873—seed at stake, and they are still to the fore, though I must say Helopeltis has made its withering mark on some parts. Were I a young man, I should like to have another innings at cacao in spite of all the ills it is heir to, and they are many!

Experience, capital and suitable land there is no getting on without, and a lot of attention must be devoted to it from first to last. Cacao and Para Rubber should do well together. I wonder there is not more grown in Native gardens—*a la native* coffee—where there are hundreds, yea thousands, of ideal spots suitable for its growth. The prevalence of stealing is a great drawback. A villager cannot grow vegetables or fruits, etc., but some rascal, who toils not, watches his opportunity to rob, and the poor cultivator is left lamenting. And that is the reason a large quantity of unripe fruit and vegetables is brought to market.—Yours truly,

J. D.

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## GREEN TEA: A QUERY.

16th Oct.

Dear Sir,—It would be interesting to know from manufacturers of Green Tea what outturn or percentage from leaf, for say a whole season, is generally secured as against that made into Black Tea, conditions being equal.—Yours truly,

VERDANT GREEN.

[The experience of some of the larger Green Tea manufacturers in Ceylon is, we believe, that they get quite as large a percentage of green tea from a given quantity of leaf, as they did formerly of black.—Ed. *T.A.*]

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## HUMIDITY OF THE ATMOSPHERE.

Katugastota Estate, Oct. 18.

Dear Sir,—Will you or any of the subscribers to your paper tell me how to work out the humidity of the atmosphere, *i.e.*, given the temperatures shown by the dry and wet bulb thermometer how can the humidity of the atmosphere be deducted.

HUMIDITY.

[The following table gives the information your correspondent requires: the saturation point being taken at 100, the figures give the percentage of water vapour in the air:—

| Difference between dry & wet bulbs. ° | Temperature of dry bulb thermometer. 60 | Difference per deg. | 68 | Difference per deg. | 76 | Difference per deg. | 84 | Difference per deg. | 92 | Difference per deg. | 100 | Difference per deg. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 100 | | 100 | | 100 | | 100 | | 100 | | 100 | |
| | | 6 | | 6 | | 6 | | 5 | | 5 | | 5 |
| 2 | 88 | | 88 | | 89 | | 90 | | 90 | | 90 | |
| | | 6 | | 5 | | 5 | | 5 | | 5 | | 4 |
| 4 | 76 | | 78 | | 79 | | 80 | | 81 | | 82 | |
| | | 5 | | 5 | | 4 | | 4 | | 4 | | 4 |
| 6 | 66 | | 68 | | 71 | | 72 | | 73 | | 74 | |
| | | 4 | | 4 | | 4 | | 4 | | 4 | | 3 |
| 8 | 58 | | 60 | | 63 | | 64 | | 66 | | 68 | |
| | | 4 | | 4 | | 4 | | 4 | | 3 | | 3 |
| 10 | 50 | | 52 | | 55 | | 57 | | 59 | | 61 | |
| | | 3 | | 3 | | 3 | | 3 | | 3 | | 3 |
| 12 | 43 | | 46 | | 49 | | 51 | | 53 | | 55 | |
| | | 3 | | 3 | | 3 | | 3 | | 3 | | 3 |
| 14 | 37 | | 40 | | 43 | | 45 | | 48 | | 49 | |
| | | 3 | | 3 | | 2 | | 2 | | 2 | | 2 |
| 16 | 32 | | 35 | | 38 | | 41 | | 43 | | 45 | |
| | | 2 | | 2 | | 2 | | 2 | | 2 | | 2 |
| 18 | 28 | | 31 | | 34 | | 36 | | 38 | | 40 | |

*Example.*—What is the humidity when the dry bulb thermometer shows 86 and the difference between the dry and wet bulbs is 9°?

For temperature 84° and difference 8° the table gives 64; the difference for 1° being 4.

For temperature 84 and difference 9° the percentage is therefore 64—4=60.

Now with diff. 8° and temp. 84° the p'tage is 64 (from table.)

„ 8° „ 92° „ 66 (from table.)

For a diff. in temp. of 8° the diff. p'tage is 2 increasing, and „ for „ 2° „ „ ½ „

Hence the percentage of humidity at 86° with a difference of 9° is 60+½=60½ %. H. O. B.]

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## SEED OF "GMELAIA ARBOREA": A CHANCE FOR THE MANAGER OF ABBOTSFORD AND OTHERS.

October 20.

[*To the Editor "Tropical Agriculturist."*]

Sir,—With reference to the letter in your number of 1st October, 1902, from "John Fraser," I have the honour to state that there is a large amount of *Gmelaia Arborea* in the forests of the North Coimbatore division, and that I could supply him with seed at the proper season (March-June). This year was a magnificeint seeding year and had I only known in time I could have supplied him with a large amount. Unfortunately, a heavy seeding year is generally followed by one or two bad years and so I have doubts about being able to collect large quantities for the next year or two. I should like to know about what amount Mr. John Fraser requires.—I have the honor to be, Sir, your most obdt. servant,

A. W. LUSHINGTON,

District Forest Officer, Coimbatore (North).

## SILK-PRODUCING MOTHS.

Peradeniya, Ceylon. 20th Oct., 1902.

Dear Sir,—By *Attacus taprobanensis*, your correspondent alludes to the insect now referred to as *Attacus atlas*, Linn.,—popularly known as the "Atlas" moth, the largest and one of the most handsome moths found in Ceylon. Our other representatives of the same family are the "Tussar Silk" moth (*Antheraea paphia*, Linn.) and the "Moon" moth (*Actias selene*, Hubn.). All of these species produce silk of a certain economic value; but they belong to the family *Saturniidae* which—though allied to—is distinct from the family *Bombycidae* to which the true silkworm (*Bombyx mori*, Linn.) belongs. With regard to the suggested crossing of domestic with wild forms, it should be noted that *Bombyx mori* (the true silkworm) is distinct, not only in species, but in genus and family also, from any of the large silk moths of Ceylon. *Bombyx mori* does not occur, in a wild state, either in Ceylon or India. It is a native of China, whence it has been introduced to all parts of the world.

It is a well-established fact that crosses, even between closely allied species, almost invariably produce infertile offspring, (e.g. mules). In the present case, where the proposed parents are separated by three stages of affinity (species, genus and family), I think it extremely improbable that

1stly,—the insects could be induced to pair:

2ndly,—if this initial difficulty were overcome, the resulting ova would probably be unfertilised:

3rdly,—If fertile eggs were actually produced resulting in healthy larvae which reached maturity, the hybrid moths would—almost certainly—be themselves infertile.

Under these circumstances success seems to me very problematical. However, the experiment can do no possible harm and, if your correspondent wishes to try it, there should be no difficulty in obtaining living cocoons of *Attacus atlas*, which is a fairly common species in Colombo. Any of the Colombo taxidermists (Mr. Lazarus for instance) could probably procure them in numbers. Packed in a light box, they should reach Algeria in good condition.

The known food-plants of *Attacus atlas* are "Mahogany" (*Swietenia mahogani*), Cinnamon, *Memecylon umbellatum*, *Osbeckia* sp., Tea *Camellia*, Cardamom (*Elettaria cardamomum*), *Cinchona*, and *Phyllanthus emblimatica*. The caterpillars have also been raised—in captivity—on apple leaves.

E. ERNST GREEN,
Govt. Entomologist.

## GREEN TEA: QUERY AS TO PERCENTAGE FROM LEAF.

Oct. 21.

Dear Sir,—I see no response to my query as to outturn of green tea from leaf. My experience does not agree with that of the authority you quoted in foot-note to my previous letter on subject. "Ball," in his book on green tea-making in China, puts down 23 per cent as outturn of dry tea from leaf (panning system) and I am sorry to say that my experience, by steaming process, during a considerable period, coincides with this. Being a matter of so great importance to all concerned I hope others may be induced to give results of their experience.—Yours faithfully, VERDANT GREEN.

[The authority we quoted for 25 per cent was backed by experience on several estates in a wet district.—Ed. *T.A.*]

## SALT AS MANURE.

Oct. 21.

Dear Sir,—Can it be that the Government is at last awakening to a sense of its duty to Agriculture in one particular direction, with which the *Observer* has identified itself for years past? The Planters' Association, I believe, at one time sought to induce the Government to issue salt at special rates for manurial purposes, but it failed in its efforts. That must have been in prehistoric times. I can recall the agitation in your columns for the past 10 to 15 years, editorially and through intelligent correspondents, in order to convince the authorities that salt can be denatured so as to render it unfit for human consumption, and that, even if such salt can, by washing or otherwise, be used for food, efforts so to use it would be too infrequent and too seldom successful, to be regarded as a danger to the revenue or to be weighed in the balance against the benefits which agriculture and stock will derive from cheap salt. The Government Agent of the Western Province is said to have sent a sample of salt to at least one low-country planter, and made inquiries which point to an early concession. If such be granted, all honour to the Lieut.-Governor, during whose administration light seems to be dawning on the official mind.—Yours truly,

PROGRESS.

## TEA AND ITS ENEMIES.

Shawlands, Lunugala, Oct. 22.

Dear Sir,—I am enclosing you, ½ dozen tea leaves all spotted over—as were the coffee leaves I sent to your office in 1870. The only difference, so far as I can recollect, is that those were yellow underneath. Have you seen anything like this before? I trust it is nothing serious—and I am yours faithfully, CHANNING ESDAILE.

[Our veteran friend Mr. Esdaile, who goes back further in Uva and Rangala than any planter now at work in Ceylon, brings "days of old" to mind with a vengeance, when he recalls what happened in 1870. In the previous year *Hemileia vastratix* was seen for the first time in Ceylon in Madulsima, and how it spread and wore out coffee we need not repeat. Tea, we are glad to assure Mr. Esdaile is in a very different position: it has its enemies, especially in blights affecting the leaves of which this is one. We have seen bushes, often, we believe, similarly affected; but to make sure will send on the leaves to Mr. Carruthers for examination. In the meantime Mr. Esdaile

understands the vast difference between coffee and tea: in respect of pruning and of getting rid, by burning, of any pest affecting the leaves of tea in a way that could never be done with poor old coffee.—ED. *T.A.*]

## GREEN TEA: REPLY TO "VERDANT GREEN'S" QUERY.

Galpothagama, Horana, Oct. 23.

DEAR SIR,—In answer to "Verdant Greens'" query *re* percentage of outturn made tea from the green leaf in making green tea—the average outturn for a whole season would be about 22 per cent: daily outturns varying according to weather from 21 to 23 per cent —Yours truly, "GREEN TEA."

[We are taken aback by this result obtained on a large lowcountry plantation, in view of the 24 to 25 per cent we were assured was obtained on other well-known places. How is the difference to be explained?—ED. *T.A.*]

## ELK DEER (GONAMUWA) AND OTHER KINDS OF DEER IN CEYLON.

Veyangoda, Oct. 24.

DEAR SIR,—On enquiry from the Director, Colombo Museum, as regards the different kinds of deer in Ceylon, I have been favoured with the following reply, dated 21st October, 1902:—"In reply to your letter of 18th inst., the following are the different kinds of deer found in Ceylon. 1, sambur or elk (gona); 2, chubul or spotted deer (tictmuwa); 3, muntjak or red deer (velimuwa or oluwa); 4 mouse deer (meeminna.)" I find that there is another very scarce and peculiar kind found in Ceylon, called elk deer (gonamuwa), in colour somewhat similar to that of elk, a quite distinct kind, size and shape same as spotted deer, there are two rows of small white spots about half inch close, each on the back only, inside the ears, round the eye-brows and top of the tail is white. To anyone interested I can show a tame pair of this deer under one-year old. You may give my name and address.—Yours faithfully, OWNER.

[The writer adds "The pair of elk referred to are to be seen at the Kola Estate, of Mr. J. P. Williams, within 1½ mile of Veyangoda railway station on the cart-road. —ED. *T.A.*]

## RAIN GAUGES AND MEASUREMENTS.

Columbia, Hewaheta, Ceylon, Oct. 25.

SIR,—My rain gauge have been a puzzle to me the last week. Perhaps you would help me to solve it. 8 find my gauge is 5 inches in diameter area= 19·635 inches (sq). Measuring glass is 1 6/ inches in diameter area = 2·4052885 inches (sq) How is the computation worked out that 4½ inches deep of water in measuring glass = ·50 of rain?—Yours, W. E. T.

[Our correspondent will be glad to have the following from a competent scientific authority:—

Suppose ·50 inch to have fallen in the rain-gauge: the area of the gauge being 19·635 square inches, the total volume collected will be ·50 × 19· 5 = 9·868 cubic-inches. Now since this amount is received in a measuring glass, the area of which is 2·405 square inches, it will fill it to a height equal to $\frac{9\cdot868}{2\cdot405}$ = 4·08 inches.

The difference between this result and 4·50 (the height measured by your correspondent) is due to the rounding of the bottom of the measuring glass and the irregular thickness of its sides. Its capacity is thus less than it would be if the interior were of the perfect cylindrical shape assumed in the above calculation. Measuring glasses are generally graduated by actual experiment.—H. O. B.]

## THE EUCALYPTS AND THEIR OILS.

The Technological Museum, Sydney, Oct 25.

*The Editor, "Tropical Agriculturist."*

SIR,—I have much pleasure in forwarding by this post a copy of the work on "Eucalypts and their essential oils" just completed at this Museum. It is the result of years of research on living material in the home of these interesting and valuable trees.—Your obedient servant,

RICH. F. BAKER, *Curator,*

[A notice of this very useful and important publication when it is received, will appear in due course.—ED. *T.A.*]

## DEER IN CEYLON.

Hambantota, Oct. 26.

DEAR SIR,—In connection with the letter *re* 'Elk Deer' in Friday's *Observer*, the deer referred to is the 'hog deer' or 'swamp deer' of India, the 'paddy field' deer of Ceylon, Axis Porcinus of Naturalists. It is found from Polgahawela through the Mirigama, Veyangoda, and Kalutara districts down to the Southern Province where it reaches as far East as the Matara district.

It is one of the four real deer found in Ceylon, of which the other three are the 'Elk' (the 'Sambur' of parts of India), the spotted deer (the 'Chitul' of parts of India) (Axis Maculatus), and the Muntjak, barking deer, rib faced deer or jungle sheep of Indian and Red deer of Ceylon sportsmen, 'Khakur' and 'Bukri,' of the N.-W. Provinces and Deccan, respectively, (Cervus Aureus,)

The spots mentioned by your correspondent are always visible in the young of the Axis Porcinus; but disappear as the animal grows older when it assumes the slatey dun colour of the 'elk,' whence the combined name 'Elk-deer' in Sinhalese as the Sinhalese never, by any chance, speak of the Elk as a deer. It is, because of the spots in the other species when young and which are entirely absent in young elk that this last gets one of its scientific names of Rusa Unicolour.

The mouse-deer is not a deer.

W. F.

## "SATURATION OF THE AIR."

DEAR SIR,—Will you kindly give the following information through the medium of your paper?

What is the maximum minimum and average mean degree of saturation of the air in Colombo?

How do the figures compare with Bombay, Madras and Calcutta?

How do they compare with Kandy and Nuwara Eliya?

What is meant by the term complete saturation of the atmosphere?

ONE WHO WANTS TO KNOW, YOU KNOW.

[Our scientific referee kindly answers the enquiry:—

"A given volume of air at a given temperature can hold a certain quantity of water vapour in the state of transparent gas. When this quantity is exceeded, the water vapour condenses into spherules which become visible as mist, fog or rain. The air is said to be saturated when it holds the greatest possible quantity of invisible vapour. The figures given in the above tables represent the proportion of invisible water vapour in the atmosphere at the time, to the maximum amount it can hold in that state; the latter being represented by 100.

| | Mean max. | Month. | Mean min. | Month. | Yearly Avr. |
|---|---|---|---|---|---|
| Colombo ... | 82 | June | 69 | Feb. | 77 |
| Kandy ... | 88 | Aug. | 62 | March | 71 |
| Nuwara Eliya ... | 92 | Aug. | 54 | Feb. | 76 |
| Calcutta ... | 90 | Aug. | 75 | April | 83 |
| Bombay ... | 88 | Sept. | 66 | Dec. | 78 |
| Madras ... | 85 | Oct. | 61 | June | 76 |

"The absolute maximum rises to 100 at every station in every heavy rain-storm. The absolute minima recorded are:—

| | |
|---|---|
| Colombo ... ... ... | 53 in April, 1884. |
| Nuwara Eliya ... ... | 41 in March, 1892. |
| Kandy ... ... ... | 41 in March, 1899. |

"I regret I cannot supply you with the same information at the Indian stations.—H. O. B."]

## TEA LEAVES FROM MADULSIMA.

[Here is Mr. Carruthers' report on the affected tea leaves sent us very lately by a Madulsima planter.—ED. *T.A.*]

Royal Botanic Gardens, Oct. 29.

The diseased spots on these leaves are on naked eye or lens examination not typical of any of the injuries caused by any of our known fungi. The Government Entomologist to whom I showed the specimens, tells me that he has seen similar spots on tea leaves in upcountry estates, but was unable to find any proof of their being of insect origin.

On making sections of the leaves through the diseased spots, and searching under the miscroscope very little mycelium of a fungus is to be found and only in dead cells of the leaf. On the surface of the leaves are to be seen many of the fruiting stalks of a fungus *Penicillium sp.* These are confined to the dead portions of the leaf at the centre of the discoloured spots. As the fungi named Penicillium are all saprophytic, *i.e.*, living on dead matter, it is probable that this fungus is an after effect, and not the cause of the disease. I have, however, begun an experiment of inoculating some leaves on a healthy tea bush with spores from these leaves, and will note if any effect is produced, that is if the fungus will grow on living tissue.

The material sent is not sufficient for a diagnosis of much value to be made The earlier stages should be examined and the conditions under which it arose should be known.

All such leaves should be taken off and *burnt* and it should be noted whether there are any fresh cases after the old ones are removed, J. B. CARRUTHERS.

## GREEN TEA AND PERCENTAGES.

Nawalapitiya, Oct. 31.

DEAR SIR,—I have made Green Tea for the past two years and all you can turn out in a 12 months inclusive of fannings and big yellow leaves picked out. is 22½ per cent. The man, who can turn out 25 per cent on his blacks (unless he goes in for crediting 5 per cent below his actual plucking for each day) is a smart man and deserves well at the hands of his agents and employers.—Yours truly,

C. T.

## INDIAN HEMP—OR "GANGA."

Oct. 31.

DEAR SIR,—Could you tell me what the law is as to the *cultivation* of Cannabis Sativa? I mean on a large scale, for it is a common thing in certain parts of the Island to see a few plants of "ganga" growing round dwelling houses. The produce of cannabis goes into the hands of the peripatetic moorman.—Yours truly, D.

[We do not think there is any Ordinance at present in the local list prohibiting the cultivation of Indian hemp, any more than of the poppy; because in deference to the Buddhist prohibition of such drugs, nothing has ever been done in Ceylon worth notice in this direction. But it will certainly become necessary now, in view of what our correspondent states, to pass such a law guarding the cultivation. Very possibly under the Opium or Bhang Ordinance any one turning the hemp or poppy into drugs for personal use or sale, can be punished.—ED. *T.A.*]

## CURE FOR RHEUMATISM.

Colombo, 9th Nov., 1902.

DEAR SIR,—The following reference to a new "cure for rheumatism" taken from *Country Life* is worth reproducing.—Yours truly, D.

About a year ago there was published in a London paper a recipe for the cure of rheumatism. Since then scores of people have written to thank the editor for it, many of them informing him that the simple prescription cured them after having been unsuccessfully treated by three or four physicians. Others, who have heard of the cure, have asked us to reprint the prescription. Everyone either suffers from rheumatism or knows someone who does, and we recommend our readers to paste the recipe on a card-board and take great care of it. Lord Anson feeling that it was a shame that such a recipe should be so little known, paid £300 to a medical man for the privilege of making it known to the public. These are the ingredients:—Sulphur 1 oz; cream of tartar 1 oz; rhubarb ¼ oz; gum guiacum 1 drachm; honey 16 oz. A tablespoonful of this is taken night and morning in a tumblerful of white wine—hock, for instance—and hot water.

## CENTIPEDES *vs.* SCORPIONS.

Galle, Nov. 3rd, 1902.

DEAR SIR,—There is an excellent native remedy for the bites of centipedes and scorpions. A mixture of burnt coir yarn and coconut oil applied to the bite will not only relieve the pain, but prevent any ill-effects by reducing the inflammation. The application should be continued for a few days till the swelling disappears.—Yours faithfully,

A.

## CEYLON OOLONG TEA.

EXTRACT OF LETTER REFERRED TO FROM MR. C. P. LARKIN.

Toronto, Aug. 11, 1902.

Why do you not take up the matter of Oolongs? As the case stands today you know that when we fought only with Ceylon Black teas we made extremely little or no headway with the Japan tea drinker, but when we gave him *his kind* of tea we made rapid headway. So far we have practically not touched the Oolong tea drinker, as the taste for Oolongs is just as distinct as the taste for Black or Green Tea. Now the samples that I have had sent to me from some of the Gardens in Ceylon prove conclusively that Ceylon can produce a tea so much better than the ordinary Formosa Oolong and yet of similar character that with proper handling it will entirely displace those teas. Events have proved that my judgment in the past has been right in regard to Ceylon Blacks and more recently in regard to Greens; therefore I think my judgment should be taken in regard to Oolongs. Besides it would benefit perhaps another class of Planters, that is, the owners of the high-grown Estates on which those fine Ceylon Oolong samples were produced. If there has been some grumbling on their part that the Green Tea Industry will only benefit the low-grown Estate Planters, why there will be reciprocity between them, each benefitting the other, as the Committee will be using their funds to create a demand for both kinds of tea. As to prices: you know that far better prices are paid for Oolongs than for any other kind of tea. And as to any interference with the trade you have now, why there will be no more than if you were introducing Ceylon Cocoa, for as I said before *we are not touching the Oolong tea drinker to any extent today* nor do I expect that we will in future with Black or Green teas. If Ceylon had had Greens as well as Blacks with which to commence the campaign in America, you would not be sending less Black here than you are today, *but you would be sending infinitely more pounds of tea.* And if you add Oolongs to your productions you will in no way injure the Black or Green Tea trade, but simply place another weapon in our hands with which to wipe out the productions of China and Japan. Do not throw this Oolong aside.—Yours truly,

(Signed) P. C. LARKIN.

RAW RUBBER NOTES.—The Balata export from the Dutch Colony, Surinam, amounted in 1901 to 237 tons, of a value of 593.475 gulden.=The German Consul of Cochabamba reports that, according to the Bolivian Government in Puerto Acre, the caoutchouc exported from the districts of Acre, and Aquiry amounted to 49,350 bales, weight 2,032.422 kilos.=The biggest quantity was shipped in May, namely, 125,374 kilos. =San José de Costa Rica exported in 1901 58.687 kilos, of raw rubber of a value of 76,293 dols. —*India-Rubber and Trades' Journal*, Oct. 27.

## PLANTING NOTES.

THE VALUE OF GYPSUM as a dressing for grass land is now being shown by the appearance of a paddock in the Drouin district, Gippsland, owned by Mr William Martin. Last season, Mr Martin states, he used eight tons of Hasell's "Corso" gypsum, and the result has attracted the notice of many farmers and graziers in the district, who have noticed the vivid green of the dressed land. One paddock which was being attacked by grubs was dressed with $1\frac{1}{4}$ cwt. of gypsum per acre, the result being that all the grubs were destroyed, and there is now a splendid sward of pasture.—*Agricultural Journal*, Oct. 10.

CURING VANILLA.—A Nilgiri correspondent writes to the *Madras Mail*:—It has now been established beyond all doubt that this valuable orchid can be successfully grown in this district. The planter whom I mentioned in some previous Notes as having taken up its cultivation has from 3,000 to 4,000 plants growing. Any intelligent Kurumber can be made to understand the artificial fertilisation of the flower. The culture would appear to be very simple. In Mexico shoots about 3 feet long are fastened to trees on the approach of the rainy season, and scarcely touching the ground. These soon strike roots attached to the bark and form plants which begin to fruit in three years, and remain fruitful for 30 or 40 years. The curing of vanilla pods is a tedious process and calls for the exercise of a good deal of care and judgment.—*Indian Gardening and Planting*, Nov. 13.

PROSPECTS FOR GREEN TEA: NEW MACHINERY—*Indian Gardening and Planting*, October 30th—has the following:—

Under this latter head of finishing teas, Indian planters will soon be supplied. Two or three systems will compete for favour. That very clever Ceylon planter, Mr. Henry Alleyn, who has lately been in Calcutta, has, in conjunction with a well-known Ceylon engineer, invented a process which is both simple and practicable, and his machine will ere long be on the market. We have been favoured with a sight of his samples and were very favourably impressed by them. Messrs. Drummond Deane as judges will also have something in this line to offer to complete their present system, and the well known firm of Messrs. Davidson and Co. have paid attention to machinery for the purpose. The Alleyn Grieve machine is in the hands of the Calcutta agent for the Drummond Deane Process and will be exhibited at work as soon as machines arrive from Ceylon. From samples we have seen, we are very favourably impressed with it. Before next season Indian planters should be able to make a choice, and the field being a wide one there is room enough for all. Green tea with the present encouragement is bound to grow. The bounty is not so large as was expected, but green teas having secured such excellent prices this season, it was perhaps thought that a bonus sufficient to cover expenses of altering manufacture and the cost of the requisite machinery was sufficient. We agree with the London Committee that "the surest way of obtaining relief from the present excess of black tea is to be found in the manufacture on a large scale of green tea suitable for the American and other markets." Since also the green tea demand offers the only large field left for the expansion of British grown, it stands to reason that it would be unwise to neglect it.

## THE ASSOCIATED TEA ESTATES CO. OF CEYLON, LTD.

DIRECTORS:—Sir Alexander Wilson, Chairman, A Bethune, Esq., J.P., S R Earle, Esq., and T C Owen, Esq.

Report of Directors and Accounts to June 30th, 1902 to be submitted at the Seventh Annual General Meeting of Shareholders, to be held at Cannon Street Hotel on Wednesday, 29th October, at 12 o'clock noon.

The Directors beg to submit herewith the Accounts of the Company for his year ending June 30th, 1902, showing a gross profit of £2,496 17s 2d., after deduction of the agreed proportion of manuring. Against this has to be put a sum of £446 13s 10d., being one-quarter of the amount standing against Buildings and Machinery, and Immature Cultivation.

After deduction of sundry charges, interest on loans, etc, there remains a credit balance of £787 0s 1d. to go against the loss shown in last year's Accounts of £963 11s 3d., making a debit balance of £176 11s 2d.

The yield of Tea for the year was as follows:—

| | | 1901-2. | | 1900 1. |
|---|---|---|---|---|
| Silverkandy | .. | 121 217 | .. | 112,045 |
| Chesterford | .. | 372,550 | .. | 345,292 |
| Horagoda | .. | 33,504 | ... | 42,833 |
| Doragalla | .. | 270 597 | ... | 229,035 |
| Total | ... | 797,868 | ... | 729,205 |

This shows an increase of 68,663 lb. on the total yield of the previous year, and exceeds Superintendents' estimates by 15,993 lb.

The cost of production per lb, f.o.b. Colombo, was as follows:—

| | 1901-2. Exclusive of Manuring, Buildings, and New and Immature Cultivation. | 1901-2. Proportion of Cost of Manuring, Buildings, and New and Immature Cultivation. | 1901-2. Total. | 1900-1. Exclusive of Manuring, Buildings, and New and Immature Cultivation. | 1900-1. Proportion of Cost of Manuring, Buildings, and New and Immature Cultivation. | 1900-1. Total. |
|---|---|---|---|---|---|---|
| Silverkandy | 32·13 | 3·10 | 35·23ct | 35·15 | 2·01 | 37·16ct |
| Chesterford | 24·27 | 2·39 | 26·66ct | 25·34 | 2·50 | 27·84ct |
| Horagoda | 27·67 | ·83 | 28·50ct | 31·77 | 0·95 | 32·72ct |
| Doragalla | 24·53 | 3·95 | 28·48ct | 30·14 | 5·57 | 35·71ct |

The average prices reduced to the London equivalents for purposes of comparison:—

| | 1901-2. | 1900-1. |
|---|---|---|
| Silverkandy | Gross 8·18d or 43·94ct | Gross 7·18d or 42·72ct |
| Chesterford | do 5·73d or 29·19ct | do 5·59d or 28·74ct |
| Horagoda | do 5·48d or 27·66ct | do 5·20d or 26·39ct |
| Doragalla | do 6·24d or 32·21ct | do 6·61d or 34·47ct |

The total tea sold for the year realised a gross average of 6·27d per lb., and cost, sold in London 5·21d exclusive of manuring. The exchange for the year averaged 1s 4 11·32 d. The yield per acre was 404 lb over the fields in full bearing.

The Directors have decided that in the interest of the shareholders the cultivation of Horagoda Estate should be discontinued. This decision has been given effect to, and has met with Mr. Fraser's full approval. Excluding Horagoda the estimate for the season 1902 3 is 795,000 lb against a crop of 764,364 lb for 1901-2.

During the year Messrs. McMeekin and Co. relinquished the Secretaryship, and it was taken over by Messrs. Rowe, White and Co. of 16, Philpot Lane, E C. Mr. John McEwan retired from the Board of Directors, and Mr. T C Owen who has had over 20 years' practical experience as a planter in Ceylon, was elected in his place. Mr. A Bethune, the Director retiring by rotation, is eligible for re-election. Mr. J M Henderson, the Auditor to the Company, retires, and offers himself for re-election.

By order of the Board, ROWE, WHITE & Co., Secretaries.

16, Philpot Lane, London, E. C. 21st Oct. 1902.

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## THE SCOTTISH TRUST AND LOAN COMPANY OF CEYLON, LTD.

Capital, £125,000; First issue (fully subscribed), £75,000; Of which paid up, £45,000; Reserve Fund, £11,000.

DIRECTORS.—James Haldane, C A, Edinburgh; John Wilson, of Messrs Honeyman and Wilson Limited, Edinburgh; Henry Johnston, K C, Advocate, Edinburgh; George M Wood, S S C, Edinburgh.

SECRETARY.—Francis A Bringloe, C.A., 123 George Street, Edinburgh. Registered Office: 123 George Street, Edinburgh. London Office: Adelaide Chambers, 52 Gracechurch Street, E.C. A Gordon Dickson London Agent. Agents in Ceylon, Messrs Cumberbatch & Co., Colombo.

REPORT by the Directors of the Scottish Trust and Loan Company of Ceylon Limited, to the Twenty-fifth Ordinary General Meeting of Shareholders, to be held within the Company's Registered Office, No. 123 George Street, Edinburgh, on Thursday, the 30th day of October 1902, at 3·30 p.m.

The directors present their Twenty-fifth Report, being for the year to 31st August 1902.

ESTATES IN THE COMPANY'S POSSESSION.—The year under review has again been a bad one for producers of tea, and prices have steadily decreased, and have now reached a very low figure. The total crop from the Company's properties amounted to 739,010 lb. or 36,000 lb. in excess of the estimate, and represents an increase over last year's figures of 32,313 lb. The average net price realised has been only 6·39d as against 7·12d for last season, or a fall of ·73 of a penny per pound.

FACTORIES, BUILDINGS, AND MACHINERY.—These are in a thorough state of repair. During the year the extension to the Brookside Factory has been completed, and new machinery erected at the Alnwick Factory.

CULTIVATION OF ESTATES.—The movement to restrict the output of tea which was mentioned in the last report resulted in no definite scheme being adopted by producers. The Directors, however, decided to rest a proportion of the Company's tea, and with this end in view 116 acres have lain fallow throughout the year. Reports from Ceylon speak very favourably of the healthy appearance of the tea thus treated.

ACCOUNTS.—The balance at the credit of Profit and Loss Account is .. £3,548 15 0

And the Directors propose to pay a dividend of 6 per cent per annum, free of Income Tax, of which 2½ per cent was paid as an Interim Dividend at Whitsunday 1902 ... 2,700 0 0

Leaving £848 15 0

to be carried forwarded to next Account.

*Mortgage held in Ceylon by the Company.*—The only remaining loan of the Company is now reduced to £2 200

*Directorate.*—The Directors regret that Mr H Herbert Anderson has resigned his seat on the Board, but has consented to remain temporarily, in an advisory capacity, at the London Office. The Director retiring by rotation is Mr George M Wood, S S.C., and he is eligible for re-election.

*Auditors.*—Messrs. Moncrieff & Horsbrugh, C.A., are eligible, and offer themselves for re-election. By Order of the Board. FRANCIS A. BRINGLOE, Secretary.

—Edinburgh, 21st Oct. 1902.

## THE CENTRAL PROVINCE CEYLON TEA COMPANY, LIMITED.

REPORT OF THE DIRECTORS.

to be submitted to the shareholders at their sixth annual ordinary general meeting to be held in the Council Room, London Chamber of Commerce, Botolph House Eastcheap, E.C., on Monday, the 3rd November, 1902, at twelve o'clock noon.

The Directors beg to submit to the shareholders the audited accounts for the year ending 30th June, 1902.

The total crop of tea from the estates for the past season was 803,315lb. against 809,858lb. of the preceding year, being a decrease of 6,543lb.

The total sales, including bought tea, were 1,049,024lb averaging 5·279d. per lb. net being ·062d less than last year.

As regards cocoa, the crop amounted to 584 cwts., against 521 cwts. last year, the average price being 49s 5d per cwt. as against 66s 1Cd. Although the quantity has been larger the profits was very much less owing entirely to the fall in price.

There were during the season 62 acres of tea not yet in full bearing.

The rate of exchange, averaged 1s 4·20d per rupee, being practically the same as last year.

The net profit for the year amounts to £2,960 15s 0d after writing off £503 from estates account for depreciation, which with £1,759 9s 2d brought forward from last year, shows a sum of £4,720 4s 2d to be dealt with. Of this amount £1,500 has been applied to the payment of an interim dividend at the rate of 6 per cent per annum on the perference shares to 31st December, 1901. The Directors now recommend a dividend of 6 per cent per annum on the perference shares to 30th June, 1902 absorbing £1,500 and leaving £1,720 4s 2d to be carried forward to next account.

Some 50 acres of tea are being put out of cultivation as being unremunerative at present prices.

Mr F M Mackwood is the Director retiring by rotation, and being eligible, offers himself for re-election.

Messrs. Fuller, Wise & Fisher, chartered accountants, offer themselves for re-electon as auditors.

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## THE CAROLINA TEA COMPANY OF CEYLON, LIMITED.

Tenth annual report of the Directors to be submitted at the tenth annual general meeting of shareholders, to be held at the Offices of the Agents, Messrs. Frith, Sands & Co., Winchester House, Old Broad Street, E. C., on the 30th October, 1902.

Your Directors beg to submit the Balance Sheet and profit and loss account for the year ending 30th June, 1902.

| | | |
|---|---|---|
| The Nett Profit is | | £6,657 8 5 |
| Amount brought forward from last year at credit of the Ordinary Shares | | £306 0 9 |
| | | £6,963 15 2 |
| From which has to be deducted Debenture Interest ... ... | | 2,450 0 0 |
| Leaving an available balance of .. which it is proposed to appropriate as follows :— | | £4,513 15 2 |
| To Reserve Fund .. | £1,200 0 0 | |
| To a Dividend on the Ordinary Shares of 5 per cent (of which 2 per cent was paid on 24th April, 1902) .. | 2,500 0 0 | 3,700 0 0 |
| And to carry forward to the credit of the Ordinary Shares .. ... | | £813 15 2 |



The Crops secured during the season compare as follows with those of previous seasons :—

| | Tea from Estates. lb. | Tea from Purchased Leaf. lb. | Cocoa from Estates. cwts. |
|---|---|---|---|
| 1901-1902 .. | 957,954 | 47,827 | 574 |
| 1900-1901 .. | 953,399 | 29,575 | 466 |
| 1899-1900 .. | 1,131,333 | 43,195 | 414 |
| 1898-1899 .. | 961,757 | 32,862 | 555 |

The cost of the Tea crop has been reduced to 4·39d per lb. free on board Colombo, as against 4·78d for the two previous seasons. The average gross sale price of Tea has advanced to 6·99d per lb. from the low average of 6·34d in the preceding season. A large crop of Cocoa has been secured, but the market continued more or less unfavourable throughout the season. The total area of land now under cultivation is 2,608 acres, comprising :—

| | |
|---|---|
| Tea in full bearing | 1,801 acres. |
| Tea in partial bearing | 630 ,, |
| | 2,431 acres. |
| Cocoa, Coffee, &c. .. .. | 177 ,, |
| | 2,608 ,, |

Owing to better market conditions during part of the year's working for the lower grades of Tea, and, to some extent, the improved quality of the Tea produced by the Company, the nett result of the past season is more satisfactory, enabling the Directors to write off from Revenue sums, amounting to £190 17s 10d and to recommend the usual sum of £1,200 being placed to Reserve. The Reports received from Mr Megginson, who is now visiting the Company's Estates, are of a satisfactory character. The Estates having been constantly maintained in a high state of cultivation has enabled the management to cope with the depressed condition of the Tea Industry by reducing appreciably the cost of the season's production of crops; but the policy of reverting to higher cultivation involving some increased expenditure in order to keep the properties in thoroughly sound condition, may be necessary, and has the careful consideration of your Board. The manufacture of Green Teas suitable to the requirements of foreign markets has been engaging the attention of your Directors, and this business is now being carried out on satisfactory terms. Your Directors have to express their satisfaction with the work of the Staff in the Company's employ, and with the Agents in London and in Colombo. The Directors retiring by rotation are Mr C A W Cameron and Mr H St. J Oscar Thompson, who, being eligible, offer themselves for re-election.

H. St. J. Oscar Thompson, Director.

London, 8th October, 1902.

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## THE LANKA PLANTATIONS CO., LTD.

Directors :—George Allen, Esq., Chairman William Austin, Esq., Henry Bois, Esq., and Edward Pettit, Esq.

Agents in Colombo—Messrs J M Robertson & Co.

Secretary—Mr. Charles M Robertson.

Authorised Capital £200,000 in 15,000 ordinary shares of £10 each, and 5,000 preference shares of £10 each, of which latter only 1,470 have been issued.

Report to be presented at the Twenty-second ordinary general meeting of the Lanka Plantations Company, Limited, to be held at the Office of the Company, on Wednesday, the 12th November, 1902, at twelve o'clock noon precisely.

1. The Directors now submit their Report for the twelve months ending 30th June last, together with the balance sheet and accounts of the Company made up to that date and duly audited.

2. The coffee crop amounted to 350 cwt. and realised £1,323 19s 1d. Last year the crop was

139 cwt., and realised £490 12s 5d. This crop was gathered off the suckers growing on the uncultivated trees referred to in the last report.

3. The total crop of cocoa gathered on Yattawatte amounted to 938 cwt., and realised £2,417 13s 7d, against 1,026 cwt. last year, which realised £3,610 3s 10d. The shortage in crops of recent years has been due to the disease which attacked the cocoa trees in Ceylon. It is hoped that Yattawatte has now passed through the worst stage, and will recover as other estates have done which were attacked earlier. Of cardamoms 777 lb. were gathered, realising £27 14s 4d, A large number of Para and Castilloa rubber trees and also coconuts have been planted on this estate, and are doing well.

4. The total yield of tea was 934,650 lb. plucked off 2,181 acres being at the rate of 428 lb. an acre, and realized £25,142 9s 6d, the average being 6·46d per lb. net. Last year the crop amounted to 974,511 lb., which realized £26,979 17s 2d, the average being 6·64d per lb. net. A factory is in course of erection on Thotnlagalla, and when completed a considerable saving will be effected in cost of mannfacturing tea on this estate. This capital expenditure is being charged to Suspense Account as usual.

5. The average rate at which drafts were negotiated on account of the seasons' crops was 1/4 1-32 per Rnpee against 1/4 12-32 last year.

6. The following statement shows the approximate acreage and state cultivation of the Company's estates on the 30th June last, as per recent surveys.

| Estate. | Tea | Cocos. | Grass. | Chena and Platena and Waste. | Forest and Timber Trees. | Total. |
|---|---|---|---|---|---|---|
| Ampitiakande | 291 | — | 4 | — | 70 | 365 |
| Arnhall | 174 | — | — | 255 | — | 429 |
| Frnit Hill | 229 | — | — | 8 | — | 237 |
| Fordyce, Garbawn, Gonagala and Paramatta | 798 | — | 5 | — | 135 | 938 |
| Rappahannock | 322 | — | 31 | 30 | 90 | 473 |
| Rillamule | 195 | — | — | 343 | 22 | 560 |
| Totulagalla | 382 | — | — | 60 | 114 | 556 |
| Yattawatte | — | 751 | 95 | 312 | 82 | 1,240 |
| | 2,391 | 751 | 135 | 1,008 | 513 | 4,798 |

7. The net profits for the past year amounted to £4,108 15s 7d, to which must be added the sum of £1,144 0s 7d, the balance brought forward from the year 1900-01, making together £5,252 16s 2d.

8. Having already paid a half-year's interim dividend on the six per cent. Preference Shares to the 31st December, 1901, amounting (less property tax) to £415 5s 6d, the Directors recommend payment of the dividend on these shares to 30th June last, requiring (less property tax) £414 7s 2d, and having deducted £1,045 6s 9d, being one-tenth of the sums charged to suspense account during the ten years ending 30th June, 1901, they further recommend a dividend of 4s per share (free of income tax) being 2 per cent on the ordinary shares, amounting to £3,000, carrying forward the balance of £377 16s 9d to next account.

9. Mr. William Austin, the Director retiring on this occasion, being eligible offers himself for re-election.

Mr. John Smith, the Auditor retires and does not offer himself for re-election.—By order of the Board,

C. M. ROBERTSON, Secretary.

12, Fenchurch Street, London, E.C., 29th Oct., 1902.

## THE MATURATA TEA COMPANY, LTD.

REPORT OF THE DIRECTORS

to be submitted to the Shareholders at the fifth annual ordinary general meeting, to be held at the offices of the Company, 16, Philpot Lane, London, E.C., on Wednesday the 5th day of November, 1902, at 12 noon.

The Directors herewith beg to submit the fifth annual report and balance sheet for the year ending 30th June, 1902.

After bringing forward the unappropriated balance of £2,210 17s 3d from last year's account, and after payment of debentnre interest and London charges (Directors' Fees, &c.), the net amount at credit of profit and loss acconnt is £3,874 13s 8d.

An interim dividend of 3 per cent has been paid on the preference shares for the half-year, amounting to £120. And the final 3 per cent was paid on the preference shares on July 1st, making 6 per cent for the year, amounting to £120. It is proposed to pay a dividend of 10 per cent less income tax, on the ordinary share capital, which will absorb £800. Thns leaving to be carried forward to next year a balance of £2,834 13s 8d=£3,874 13s 8d,

The past year has been very trying to producers of high grown teas, as buyers have throughout the year almost entirely centred their interest upon low-medium descriptions ; notwithstanding this, it has been a highly satisfactory one for the Company, owing to the fact that we have, to a very large extent, been independent of the London market, the bulk of our produce having been disposed of for export.

During the past year a further £500 of the debenture debt has been paid off. This rednces the debt to £6,000 thus enhancing the value of the preferred and ordinary shares.

The average of onr tea is 8·17d as against an average of 7·06d per lb. for all Ceylon tea during the same period, and our crop shows an increase of 13,139 lb. The cost of putting the produce, F O B, Colombo, has been 4 cents cheaper than last year.

Mr Guy Owen retires in accordance with the articles of Association, but being eligible, offers himself for re-election as a Director.

The Anditors, Messrs. Chas. E Bradley & Co. also retire, but, being eligible, offer themselves for re-election.

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## THE SOUTH TRAVANCORE TEA COMPANY, LIMITED.

REPORT OF THE DIRECTORS

to be submitted at the sixth annnal ordinary general meeting, to be held at the offices of the Company, 16, Philpot Lane, London, E.C., on Tuesday, November 11th, at 2·15 p.m.

The Directors beg to submit herewith their sixth annual report and balance sheet for the year ending 30th June, 1902.

The outturn of tea was 269,250 lb, being 45,750 lb below the original estimate, against 302,329 lb last year.

The average price realised was 4·82d per lb, as against 4·72d last year and 5·38d the year before. The gross profit was £599 6s 1d, against £1,294 13s 4d last year, and £2,158 13s 11d the year before.

After providing £250 for the Debentnre Sinking Fund and writing off £250 for Depreciation of Machinery, there is shown a loss of £632 5s 2d, which after deducting the credit balance of £574 17s 7d carried forward from last year, leaves a debit balance of £57 7s 7d,

During the past year the tea industry has continued to suffer from the low prices alluded to last year. Mr Stewart, the Manager, has just returned to the estate after a visit to England for his health. He has relieved Mr Cook, who was acting for him during his absence.

Shortness of labour, owing to the constrnction of the new railway, resulted in a very heavy reduction in the crop, which was 33,179 lb below the low crop of the previous year.

This is a most disappointing result, and the Directors can only hope that Mr Stewart will be able to

get labour to harvest the full crop estimated for the new season.

The area under tea amounts to 730 acres.

The Manager's estimate for the present season is 310,000 lb.

In accordance with the Articles of Association, Lieutenant-Colonel Colvile retires by rotation, and, being qualified, offers himself for re-election.

The Auditors Messrs. Jackson, Taylor, Abernethy & Co., retire, and, being eligible, offer themselves for re-election.

October 30th, 1902.

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## THE GOOMERA (CEYLON) TEA ESTATES COMPANY, LIMITED.

### REPORT OF THE DIRECTORS.

The Directors beg to submit herewith their eighth annual report and balance sheet for the year ending 30th June 1902.

The accounts, after paying debenture interest and London expenses, show a profit of £404 10s 6d which deducted from the debit balance of £2,175 15s 10d brought forward from last year, leaves a loss of £1,771 5s 4d to be carried forward.

The total crop from the Company's estates amounted to 142,488 lb. realising a net average of 6d per lb., against 245,313 lb harvested from the Company's estates the previous year, which realised a net average of 4·13d.

During the past year the system of high cultivation advocated by Mr. Joseph Fraser, and previously mentioned, has been continued by the Directors. The results have justified the wisdom of this step, as the figures for the past season show. In view of the serious crisis through which the tea industry is now passing, the result cannot be looked on as otherwise than satisfactory. The Directors consider that the prices realised for the tea reflect credit on the management of the Company's properties in Ceylon.

The estimate for the new season is 170,000 lb from Goomera, and 97,500 lb from Hunugalla, against a crop of 150,407 lb (exclusive of bought leaf) from Goomera and 89,480 lb from Hunugalla last year.

The Directors not having drawn any fees for some years, propose drawing half for the past season.

Mr. F E Cobb retires in accordance with the Articles of Association, and being eligible, offers himself for re-election.

The Auditor, Mr. J D Stewart Bogle, C.A. retires and offers himself for re-election.

October 28th, 1902.

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## CEYLON LAND AND PRODUCE COMPANY, LIMITED.

Directors.—James Wilson, Esq., Chairman, Wm. H Haslam, Esq., Alex. D Wilson, Esq.

Report of the Directors, to be submitted to the eighteenth annual general meeting of shareholders, (on Friday, the 14th day of November.

Your Directors have the pleasure to submit the annexed profit and loss account and balance sheet for the crop year ending 30th June, 1902, duly audited. 319 shares of £5 each, being part balance of the six per cent. Cumulative preference capital, were allotted during the past year, and the premiums received, less cost of issue, transferred to Reserve Fund in the sum of £185. The amount of credit of Profit and Loss account is £7,053 5s 1d, which, with the sum of £327 2s 1d brought forward from last year, leaves £7,380 7s 2d to be distributed. On the 22nd July last an Interim Dividend of 7½ per cent on the Ordinary Shares and 3 per cent on the Preference Shares was paid, and your Directors now propose to pay on the 13th day of December, 1902, the balance of the fixed Cumulative Dividend on the Preference Shares (3 per cent) making 6 per cent for the year, and 7½ per cent on the Ordinary Shares, making 15 per cent for the year, all free of Income Tax, and carry forward the balance of £1,120 2s 2d, subject to the Directors' remuneration for the year under review and to the payment of income Tax, &c. A sum of £954 10s 10d spent upon permanent improvements during the year has been debited to Revenue. In accordance with a Resolution of the Board, a Call of 10s per Share was made upon all Members holding Preference Shares upon which £4 10s had been paid, and the same was payable on the 1st July last. These Shares are now fully paid.

Your Directors have to report that the total Crop of Tea from the Company's Estates for the year amounted to 986,862 lb, representing a shortage on the Estimates of 82,888 lb; there were, however, increases of 10,061 lb made from purchased leaf, and of 68,227 lb made from others, the outturn aggregating 1,440,150 lb, as compared with the provision made at the commencement of the season for 1,444,750 lb, a deficiency of only 4,600 lb. The net average price obtained is again low, it being only fractionally better than that recorded last year viz, 5.46, *versus* 5.28d; the mean rate of exchange (1s 4⅜d) remains the same, and Freights were the turn higher. Your board desire to point out that their declared policy of sparing no expense to bring the Company's Estates into the best possible state of cultivation has been persevered with, and there is no doubt the present condition of the properties fully justifies the course taken; during the year R24,318 (£1,659 3s. 11d.) were expended on manuring Tea and Cocoa, the whole of which has been debit to Revenue Account. The Coca crop totalled 2,865 cwt, as compared with an estimate of 2,325 cwt.; the prices, however, shew a marked falling off. The greatest efforts continue to be taken to keep Cocoa disease well under control, and as a matter of fact the Government Mycologist reports that the work of cutting out cankered parts of trees had been well done, and in his opinion was effective in curing the trees so treated in a very large proportion of cases; he adds, that the measures adopted promise excellently, and if vigorously carried out should ensure that very little need be spent per acre in the future. The census of Coconuts taken in June last indicates a total number of 47,088 trees, equal to 620 acres, at the rate of 76 trees per acre. It was found necessary to extend the North Matale and Strathisla Tea factories, and increase the machinery in the latter building to fully cope with the larger output; the Directors have under their consideration the question of erecting a Green Tea factory on Alloowihare.

Tea.—The output has been a fair average one in point of quality, although the standard of excellence reached in 1901 was not upheld. Unfortunately also the Indian crop contained a large proportion of medium and low class Tea, which, competing with Ceylon, kept prices for common and fair grades much under those of the year before, consequently rendering the result of working of many estates unsatisfactory. On the other hand, however, there was a brisk demand for all invoices with attractive flavour. * * *

Cocoa.—The demand for this article during the first six months of the year was slow, and in consequence much lower prices were recorded. At the end of August values improved, owing to the demand from America, partly resulting from the short Java crop, and a material advance took place which has been since well maintained. Finest kinds—of which the supply is very small—are considerably higher than they were at the beginning of the year, and the Directors are of opinion that the prospects of good values for next season are very favourable. The statistical position of all kinds of Cocoa is good, the deliveries showing an increase on last year's, the stocks being now much smaller,

Acreages.—The following Statement shows the approximate acreage of the Company's Properties at date:—

| Name of Estate. | Tea 3 years. | Tea over 3 years. | Cocoa Bearing | Cocoa Not Bearing. | Cocoa, Coffee, &c. | Forest, Grass, Chena abandoned, &c. | Total Acreage |
|---|---|---|---|---|---|---|---|
| Allowiharie Group | — | 214½ | 319 | 28 | 116¼ | 15 | 692¾ |
| Andangodde Estate | — | 176¼ | — | — | — | — | 176¼ |
| Fetteresso Estate | 5 | 405 | — | — | — | 28 | 438 |
| New Peradeniya Est | — | 386† | 18 | — | — | 50½ | 454½ |
| North Matale Group | — | 407 | 733 | 10 | 85 | 360 | 1595 |
| Owella Estate | — | — | 47 | 171* | — | 239 | 457 |
| Rickarton | 2 | 538 | — | — | — | 56 | 596 |
| Strathisla Group | 39½ | 220 | 167* | 7 | — | 5¼ | 438¾ |
| Forest Land | — | — | — | — | — | 430 | 430 |
| | 46½ | 2346¾ | 1284 | 216 | 201¼ | 1183¾ | 5278¼ |
| | 2393¼ | | 1500 | | | | |

† And Cocoa * And Tea

N.B.—In the absence of detailed surveys these figures, as mentioned above, are approximate only.

The Estimates for current year provide for a Crop of 1,089,025 lb. Tea from the Company's Estates, 128,000 lb. from bought leaf, and 240.000 lb made for others, a total of 1,457,025 lb., campany with 1,440,150 lb. manufactured last year. The intake at date of latest advices compares favourable the Crop secured at the same time in 1901. The Crop of Cocoa is estimated to be 2,680 cwt.

A vacancy in the Directorate was caused by Mr L A Lewis ceasing to be a Member, and in accordance with the Articles of Association, this has been filled by Mr Wm. H Haslam, of Messrs. Geo. White & Co., 31 Fenchurch Street, E.C. Mr W H Haslam, by rotation, retires from the Directorate, but being eligible, offers himself for re-election. Mr James B Laurie. the Auditor, also retires, but he is eligible, and offers himself for re-election.

By order of the Board, James Wilson, Chairman, Alfred E. Lock, Secretary.

London. E.C., 6th Nov., 1902.

## STATISTICS FOR PAST 13 YEARS.

TEA.

| Year ending 30th June. | Acres of Tea in bearing. | Crop, lb. | Average per acre, lb. | Teas made for others, and from purchase Leaf, lb. | Net Average per lb realised for all Tea sold in London. | Rate of Exchange. | Rupee Cents. |
|---|---|---|---|---|---|---|---|
| 1890 | 1131 | 354842 | 314 | 286292 | 9·46d | 1/5½ | 54·06 |
| 1891 | 1345 | 480684 | 358 | 357648 | 9·10d | 1/6 | 54·61 |
| 1892 | 1385 | 503293 | 364 | 479005 | 7·81d | 1/4¾ | 46·63 |
| 1893 | 1406 | 589192 | 419 | 528172 | 7·70d | 1/3 | 51·33 |
| 1894 | 1451 | 608110 | 419 | 342040 | 6·77d | 1/2½ | 46·68 |
| 1895 | 1556 | 597399 | 348 | 435908 | 7·34d | 1/1¼ | 55·40 |
| 1896 | 1556 | 694720 | 446 | 590111 | 6·80d | 1/2 | 48·57 |
| 1897 | 1571 | 748994 | 476 | 432652 | 6·51d | 1/3 | 43·40 |
| 1898 | 1636 | 753151 | 460 | 393360 | 6·22d<br>6.27d*a* | 1/4 | 38·88<br>39·19*a* |
| 1899 | 1754 | 754768 | 430 | 281457 | 6·75d<br>6·78d*a* | 1/4¼ | 41·54<br>41·72*a* |
| 1900 | 1814 | 865768 | 477 | 406327 | 6·19d<br>6·21d*a* | 1/4½ | 37·51<br>57·64*a* |
| 1901 | 2103 | 917038 | 435 | 483102 | 5·24d<br>5·28d*a* | 1/4⅜ | 32·00<br>22·24*a* |
| 1902 | 2391 | 986862 | 413 | 453288 | 5·38d<br>5·46d*a* | 1/4⅜ | 32·86<br>33·35*a* |

*a* Including Sales made in Colombo.

COCOA. DIVIDEND

| Year ending 30th June. | Crop, cwt. | Net Average per cwt. | Highest price realised. | Ordinary* per cent. |
|---|---|---|---|---|
| 1890 | 1224 | 95/11 | 115/ | 10 |
| 1891 | 1355 | 108/ | 129/6 | 10 |
| 1892 | 1431 | 96/5 | 120/ | 15 |
| 1893 | 2201 | 90/11 | 130/9 | 15 |
| 1894 | 1212 | 58/4 | 83/6 | 15 |
| 1895 | 2840 | 59/2 | 65/ | 15 |
| 1896 | 2335 | 56/8 | 80/ | 15 |
| 1897 | 2266 | 66/1 | 85/ | 15 |
| 1898 | 2523 | 68/3 | 80/ | 15 |
| 1899 | 2594 | 66/83 | 86/ | 15 |
| 1900 | 1574 | 78/ | 102/6 | 15 |
| 1901 | 2378 | 72/6 | 103/6 | 15 |
| 1902 | 2865 | 59/11 | 80/ | 15 |

*a* And 5 per cent Bonus.

[* Preference dividend has been 6 per cent. besides, year by year.]

## KORALE TEA ESTATES, LIMITED.

Directors:—W. S. Bennett, Chairman, J. L. Shand, H. W. Brett; Secretary:—H. C. Dowling; Agents in Ceylon:—Cumberbatch & Co., Colombo; Agents and Offices:—Shand, Haldane & Co., 24, Rood Lane, London, E.C.; Auditors:—McAuliffe & Davis, Threadneedle House, 28–31, Bishopsgate Street, E.C.

Report of the Directors, to be submitted at the Sixth Annual Ordinary General Meeting of Shareholders, to be held at the Offices of the Company, on Thursday, 16th October, 1902, at 3 p.m.

The Directors now submit the Report and Accounts for the year ending 30th June, 1902, which have been duly audited.

| | £ s. d. | |
|---|---|---|
| The net amount at Credit of Profit and Loss Account, after providing for General Expenses is ... ... ... | 939 1 4 | |
| To which should be added the balance brought forward from 30th June, 1901 ... ... | 142 16 8 | |
| | | 1,081 18 0 |
| To dispose of which it is proposed to pay a dividend of 1½ per cent on the Preference Shares which will absorb ... ... ... | 718 5 6 | |
| To write off Wewesse Factory account ... ... ... | 100 0 0 | |
| Directors' Fees ... ... | 150 0 0 | |
| And to carry forward a balance of | 113 12 6 | |
| | | £1,081 18 0 |

Though the estimate of crop has been exceeded, and the cost of production upon all the estates lessened, the Directors regret that the continuation of low prices for all tea prevents the recommendation of a higher dividend. The crop might have been still further increased if the Directors had not continued to carefully nurse the younger fields, in addition which a considerable area of the older tea has been this year rested. The Directors are satisfied that this policy will be to the permanent advantage of the estates. The reports as to the order and condition of the estates are satisfactory, and the large area of promising young tea on Wewesse is likely to rapidly increase the crop yied. In accordance with the Articles of Association Mr. W. S. Bennett retires from the Board, and being eligible, offers himself for re-election. The Directors desire to express their satisfaction with the Agents and Managers in Ceylon, who have done their utmost to carry out the wishes of the Directors for the strictest economy compatible with the efficient working and up-keep of the Company's properties.

By Order of the Board, H. C. Dowling, Secretary.

ACREAGE OF ESTATES.

| | Tea. Over 4 Years. | Over 2 Years. | Over 1 Year. | Under 1 Year. | Chena & Patna. | Fuel. | Forest. | Total. |
|---|---|---|---|---|---|---|---|---|
| Riverside | ...290 | — | — | — | 88 | 12 | — | 390 |
| Glenloch | ...178½ | — | — | — | 82 | 55½ | — | 316 |
| Karagastalawa | 178 | 61 | 1 | 10 | 70 | 58 | 14 | 392 |
| Wewesse | ...449 | 151 | — | — | 151 | 3 | 50 | 804 |
| | 1,095½ | 212 | 1 | 10 | 391 | 128½ | 64 | 1,902 |

| | Crop. 1901 & 1902. | Crop. 1900 & 1901. | Expenditure on Production. 1901 & 1902. Exchange, 1/4 11·32. | | | Cost of Production. 1901 & 1902. | Cost of Production. 1900 & 1901. | Average Net Price in London. 1901 & 1902. | Average Net Price in London. 1900 & 1901. | Return per Acre. |
|---|---|---|---|---|---|---|---|---|---|---|
| | lb. | lb. | £ | s. | d. | d. | d. | d. | d. | d |
| Riverside | 143416 | 137423 | 2210 | 11 | 1 | 3·69 | 3·89 | 4·86 | 4·51 | 494 |
| Glenloch | 72519 | 54839 | 1370 | 3 | 6 | 4·53 | 5·46 | 5·35 (Glenloch and Karagastalawa) | 5·84 (Glenloch and Karagastalawa) | 406 |
| Karagastalawa | 61021 | *63995 | 1330 | 19 | 8 | 5·23 | 5'31 | | | 342 |
| Wewesse | 112330 | 98000 | 2595 | 16 | 5 | 5·54 | 5·68 | 5·71 | 5·67 | 250 |

* Including 7,000 lb. made from bought leaf.

## THE CONSOLIDATED ESTATES CO., LTD.

| | | |
|---|---|---|
| Authorised capital | | £100,000 |
| Divided into 5,000 preferred shares of £10 each entitled to a cumulative preferential dividend of 8 per cent | £50,000 | |
| 5,000 ordinary shares of £10 each | 50,000 | |
| | £100,000 | |

Eleventh annual report of the General Managers, to be submitted to the shareholders at the general meeting, to be held at 34, Great St. Helens, E.C., on Wednesday, the fifteenth October, 1902, at 11·30 a.m.

The General Managers have the pleasure to submit their Eleventh Annual Report and Balance Sheet, together with Statement of Accounts for the Crop Year ending 30th June, 1902.

The Profit and Loss Account shows a balance (including £1,081 2s 9d brought forward from last year) of £6,777 8s 5d, after paying Interest on the Debentures, and an Interim Dividend of 4 per cent on the Preferred Shares.

Out of this sum the General Managers propose—

| | £ | s. | d. |
|---|---|---|---|
| To pay a Balance Dividend of 4 per cent on the Preferred Shares, making 8 per cent for the whole year, which will absorb ... | £1,560 | 0 | 0 |
| *To set aside for redemption of five per cent of the Debentures at 103 ... | 2,575 | 0 | 0 |
| To pay a Dividend of 4 per cent on the Ordinary Shares ... | 1,560 | 0 | 0 |
| To place to Reserve Fund ... | 500 | 0 | 0 |
| Carrying forward the Balance, viz :— ... | 582 | 8 | 5 |
| | £6,777, | 8 | 5 |

* By the Articles of Association it is provided that no Dividend can be paid on the Ordinary Shares in any one year unless five per cent of the Debentures have been redeemed for that year.

The following shows the result of the year's working viz :—

NET PROCEEDS OF CROP.

| | £ | s. | d. | £ | s. | d. |
|---|---|---|---|---|---|---|
| 1,726,241 lb Tea at an average net price about 5½d. per lb realized | 39,651 | 1 | 3 | | | |
| Cocoa, Cardamoms Cinchona Bark & Cinnamon | 1,860 | 18 | 4 | | | |
| Surplus on estimated value of Produce brought forward from 1900-01 | 17 | 9 | 7 | | | |
| Interest on Account | 176 | 1 | 0 | | | |
| | | | | 41,705 | 10 | 2 |

EXPENDITURE ON ESTATES.

| | £ | s. | d. | £ | s. | d. | £ | s. | d. |
|---|---|---|---|---|---|---|---|---|---|
| Messrs George Steuart & Co.'s draft —R454,547 at an average of 1/4 23-64 per rupee | £30,986 | 7 | 4 | | | | | | |
| *Less* Balance of Coast Advances | 323 | 5 | 2 | | | | | | |
| | | | | 30,663 | 2 | 2 | | | |
| Bonus to Superintendents —R5,500 @ 1/4 1·32 | | | | 3367 | 7 | 8 | | | |
| | | | | | | | 31,030 | 9 | 10 |
| Profit on Crop Account | | | | | | | £10,675 | 0 | 4 |

The General Managers are glad to be able to inform the Shareholders that the anticipations expressed in the last Annual Report have to a great extent been verified, with the result that the past season's operations have been much more favourable than those of the preceeding year.

During the first six months of the past season, the weather in Ceylon was not favourable for the growth of tea, and at one time the falling off in the crops harvested, as compared with the previous year to the same date, amounted to nearly 150,000 lb; but, on the other hand, owing to short supplies and improved quality of the tea, the average price realised was much better. During the second six months of the season, however, these conditions were precisely reversed; the weather was very suitable for the flushing of tea, and the deficiency of crop was to a great extent recovered, but prices were poor. The net result of the year's operations has been to produce a crop of 1,726,241 lb tea, against 1,787,560 last year, at a cost 4 16 per lb, against 4·35d, while the price realised for the tea averaged 5½d per lb net against 5 5-16d for the previous season.

Exchange during the past season has averaged 1s 23·64d for drafts at three months' sight, which corresponds exactly with that of last year.

The amount realised for products other than tea has been much larger than usual, owing to the exceptional quantity of cinchona bark harvested. This bark realised £1,127 13s 7d, whereas last year the net proceeds amounted only to £239 8s 11d. The General Managers being of opinion that this product can hardly be treated as pure revenue, seeing that each time a tree is barked brings it nearer to final extinction, have decided to carry £500 of the above proceeds to credit of the Reserve Fund. Young trees are coming on to take the place of those that die out or have to be removed, but it takes some years for them to reach the productive stage.

The other extraneous products have realised about the amount estimated, and are all doing well.

No new properties have been acquired since the date of the last annual report, and the total acreage of the Company's estates remains unaltered, viz., 5,484 acres. But in accordance with the promise made in last year's report a careful survey has been made of

the reserve land suitable for tea, and the following tabulated statement gives the result :—

| Name of Estates. | Ceylon District. | Tea Full Bearing. | Tea Partial Bearing | Tea Recently Planted. |
|---|---|---|---|---|
| Wattegodde | Dimbulla ... | 800 | Nil | 25 |
| Hoonoocotua | Kotmale ... | 559½ | 25 | 15 |
| Tallagalla | Kalutara ... | 515 | 48 | 54 |
| Ellagalla | Matale .. | 225 | 6 | 9 |
| Rutland | Hewaheta .. | 449¼ | 3 | 66 |
| Warriagalla | Nilambe ... | 422½ | 83¾ | 4 |
| Sorana | Kalutara .. | 421 | 79 | 45 |
| Totals | ... | 3,392¼ | 244¼ | 218 |

| Name of Estates. | Ceylon District. | Reserve Suitable for Tea. | Other Products, Grass Waste, Water, &c. | Total Acreage. |
|---|---|---|---|---|
| Wattegodde | Dimbula ... | Nil | 70 | 895 |
| Hoonoocotua | Kotmale .. | 52 | 110½ | 762 |
| Tallagalla | Kalutara ... | 25 | 58 | 700 |
| Ellagalla | Matale ... | 15 | 190 | 445 |
| Rutland | Hewaheta ... | 17 | 127¾ | 663 |
| Wariagalla | Nilambe ... | 150 | 601 | 1,261 |
| Sorana | Kalutara ... | 75 | 138 | 758 |
| Totals | .. | 334 | 1,295¼* | 5,484 |

* Of which more than 300 acres are planted with Cardamoms, Cocoa, Cinnamon and Cinchona.

Last year's Estimate of Expenditure of Capital Account was £600 to £700, and the amount actually spent was £675 2s 4d, which has been carried to debit of the Factory and Extension Account. This account after having received credit for the proceeds of the New Issue referred in the last Report, shows a small debit balance of £405 9s 3d. The estimated expenditure on this account for the current season amounts to between £800 and £900, being chiefly for additional machinery required for Sorana and Warriagalla.

The Estimate of Crop Expenditure and Yield for the new season have been prepared as usual with much care, and are as follows, viz :—

| | Expenditure. R. | Crop. lb Tea. |
|---|---|---|
| Wattegodde .. | 116,719 | 450,000 |
| Hoonoocotua .. | 80,071 | 280,000 |
| Ellagalla ... | 31,902 | 120,000 |
| Tallagalla ... | 58,552 | 235,000 |
| Warriagalla .. | 65,576 | 240,000 |
| Rutland .. | 64,105 | 250,000 |
| Sorona ... | 66,358 | 275,000 |
| Totals | R483,283 @ 1/4⅜=£32,974. | 1,850,000 |

Also about 15,000 lb of Cinchona from Rutland, 10,000 lb Cardamoms and 15 cwt Cocoa from Warriagalla and 15,000 lb Cinnamon from Sorana; the value of the whole of such products being estimated at about £1,000 to £1,200.

The General Managers are glad to state that the very full Reports on the Estates which they receive from the Company's Ceylon Agents continue to be on the whole thoroughly satisfactory. The grey blight, which at one time caused considerable anxiety, has happily yielded to the remedial measures applied, and has almost entirely disappeared. So that with normal weather and even moderately good prices for Tea, the prospects for the coming season appear to be satisfactory.

Arbuthnot, Latham & Co., *General Managers.*
34, Great St. Helens, E.C., 6th Oct., 1902.

## THE DOOMOO TEA COMPANY OF CEYLON, LIMITED.

### THE REPORT.

The Directors have the pleasure to submit their Report and the Accounts for the year ending June 30th 1902.

The crop realized was 296,863 lb. against an Estimate of 260,000 lb. and netted 36·05 cts. per lb. against 04·39 cts. last year.

The falling-off in price is to some extent due to the fact that there were several alterations and additions to the factory and machinery about the middle of the year which hampered work and prevented the tea being made to the best advantage.

On the other hand the cost of the tea was only 24·33 cts. per lb. against 26·95 last year. This rate is not high and reflects credit on the Manager.

There is now a sum of R40, 059·32 to be dealt with and the Directors recommend its being disposed of as follows :—

| | |
|---|---|
| That there be passed to Depreciation account a sum of .. .. | R 5,000·00 |
| That there be passed to Reserve account | 5,000·00 |
| That a Dividend of 7 per cent be paid, absorbing .. .. | 28,000·00 |
| And that there be carried forward a sum of | 2,059·32 |
| | R 40,059·32 |

The Estimates for the current season provide for a crop of 275,000 lb. tea to cost R71,310·00 exclusive of Capital Expenditure which will not be large.

The acreage of the two estates is as follows :—

| | | | |
|---|---|---|---|
| Doomoo .. | 213 | acres | Tea 5 years old and upwards |
| | 12 | do | do under 1 year. |
| | 16 | do | Timber. |
| | 58 | do | Chena and Patana. |
| | 299 | acres. | |
| Verellapatna .. | 500 | acres | Tea 5 years old and upwards. |
| | 24 | do | do 4 years old. |
| | 4 | do | do under 1 year. |
| | 6 | do | to be planted. |
| | 10 | do | Grass. |
| | 2 | do | Timber. |
| | 142 | do | Chena and Patana. |
| | 688 | acres. | |

During the year Mr W Kingsbury having left the Island, Mr W Anderson was appointed a Director in his place. The latter gentleman retires in accordance with the Articles of Association but being eligible offers himself for re-election.

It will be necessary to appoint an Auditor for season 1902-03.

By order of the Board of Directors,
J. M. ROBERTSON & Co.
Colombo, 16th October, 1902.

## BRITISH CENTRAL AFRICA COMPANY, LIMITED:

### Planting Progress.

The statutory general meeting was held yesterday (Oct. 31) at Winchester-house. Major George Wemyss who presided, observed that as a good deal of misconception existed in England as to the exact locality of British Central Africa, it might be as well if he stated that it was that region of Africa which would always be associated with the name of Livingstone and with the great Scotch missionary movement in the Shire Highlands and about Lake Nyassa. In 1883 the British interests in Nyasaland had become so considerable that Her Majesty's Government appointed a British Consul to Nyasaland with headquarters at Blantyre. This was immediately followed by the starting of the planting industry, which soon showed most encouraging results in the cultivation of coffee, cotton and tobacco. In 1889 the future of Nyasaland assumed an entirely new aspect by reason of the discovery or re-discovery by Mr J Rankin of a navigable entrance to the

Zambesi by the Chinde mouth. This opened up a direct waterway to the Shire districts, and disposed of the great obstacle to the development of the country caused by its only means of approach being through Portuguese territory. In the spring of 1891 a British protectorate was proclaimed over the countries adjoining Lake Nyasa, and the Protectorate of Nyasaland was instituted. In February 1893, the name of the protectorate was changed to the British Central Africa Protectorate, which this company had been formed for the purpose of developing by establishing through communication by water and rail between Chinde and the Central African lakes region and by developing the planting and mining industries, and British trade generally, within the protectorate. In British Central Africa they were not dealing with the raw uncivilized country one usually associated with the words "Central Africa" but with one which possessed a properly organized civil administration, with its post and telegraph, judicial, medical, scientific, and survey departments, and regularly organized military forces. How important the question of a railway was to the commercial development of the country was evidenced by Mr. Commissioner Sharpe's official report to the Foreign Office for the year 1900-1901, from which he quoted. From Chinde at the mouth of the Zambesi to the north end of Lake Nyasa was approximately 800 miles. For 600 miles there was a waterway upon which steamers were regularly plying—from Chinde to Chiromo 250 miles, and from the south end of Lake Nyasa to the north end 350 miles ; but the whole utility of the route practically depended on the facilities for carriage over the connecting link of 200 miles between Chiromo and Lake Nyasa. At present the traffic over this connecting link was mainly dependent on native porters, and the traffic north of Chiromo was practically limited to what they could carry. In addition to providing for the wants of the protectorate and the rapidly increasing demands of the mineral districts of North-Eastern Rhodesia, &c.,

THE RAILWAY

would have to carry the whole trade of the Nyasaland regions, including that from German East Africa, which found its outlet at Langenberg at the north end of the lake; and the easiest and cheapest route even to lake Tanganyika, was undoubtedly by the Shire and Lake Nyasa. Existing means of transport had been utilized to their utmost limit, and the further development of the districts in question was absolutely dependent on the construction of a railway. His Majesty's Government being convinced of this fact, had agreed to grant to the Shire Highlands Railway Company (a subsidiary company of this company) a concession for the construction and working of a railway from Chiromo, via Zoa and the Cholo plateau to Blantyre, and thereafter northwards to a point completing the connexion with Lake Nyasa. The British South Africa Company also realizing the urgent necessity for this railway and the great assistance it would be in the development of their lands in Nyasaland and North-Eastern Rhodesia had assured this company of their support, in connexion with which negotiations were proceeding. The company would enter into an agreement with the Shire Highlands Railway Company to construct and equip the first section of the line at a certain sum per mile to be paid in debentures and ordinary shares of the railway company, together with the land grant received from the British Government. In order to provide the necessary funds for this purpose it was proposed to make an issue of debentures of the British Central Africa Company at an early date. The company had also acquired as a going concern, Sharrer's Zambesi Traffic Company, which had been operating in the district since 1894 with satisfactory financial results. When railway connexion was made with Lake Nyasa, their company would be in a position to quote reduced through rates and fares between London and all stations on the whole of the route to the north end of the lake. The line was the connecting link of a through service from the coast to the north end of Lake Nyasa, a distance of over 800 miles. This service would practically control the whole of the carrying trade for the Nyasaland regions. The company had further acquired the Nyasaland estates comprising about 372,000 acres of freehold land, a considerable portion of which had already been laid out in plantations, from which "maiden" crops of coffee had already been received. The land was not only suitable for coffee, but also for cotton and tobacco. The only obstacle to the development of these industries were want of labour and proper transport facilities and these would be provided for by the railway. For many miles of its route the line from Chiromo to Blantyre would pass through the company's estates. In addition to the Nyasaland estates they would possess the land granted by the British Government in return for the construction of the first section of the railway—about 265,000 acres. A considerable proportion of this land was also in close proximity to the railway. The company had acquired the properties referred to for fully-paid ordinary shares, so that their debentures when issued would be a first charge, not only upon the railway that had to be constructed, but also upon the entire assets of the company. In acknowledging a vote of thanks, the chairman stated that 900 of the Central Africa Rifles who came from the protectorate were going to Somaliland with the relief expedition.—London *Times*, November 1,

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## LONDON TEA CHARGES.

A meeting of the Tea Clearing House has been held this week, at which it was decided to endeavour to arrange a conference with the trade with a view to the settlement of the point at issue. 'The trade, having unanimously asked for the withdrawal of the boycotting clause, will probably,' says the *Produce Market Review*, 'only consent to discuss other matters after that is out of the way, but apart from this there is a great deal that can be done by mutual and friendly discussion. The following rough estimate of the London tea charges in the course of a year shows the great importance of the issues to our tea growers, for a burden of some £350,000 a year is a heavy one for an unprosperous industry. It is a small detail in such an amount, but the charge entailed by weight notes is worse than useless, as it complicates matters unnecessarily, and leads to a lot of useless labour. The warrants issued are also far too numerous, and a reduction in their number, by putting more packages on each, would effect a reduction in the stamp charges and would be otherwise useful. Bulking and separate taring are heavy charges that might be avoided, as we have urged for many years. The

empty packages should be cut to scale so that they weigh alike, and bulking ought to be done in all cases on the gardens. We may mention that one of the results of the existing dispute is to advertise the extent of the tea charges, with the effect of leading to competition. For instance, an application is being made to the Customs for a fresh bond by a large waterside warehouse."

AGGREGATE LONDON DOCK OR WHARF CHARGES ON TEA.

Landing charges on tea imported into London for twelve months.—Say 2,200,000 (two million two hundred thousand chests). Average gross weight 90/129 lb.

Landing and Housing Rate, which includes landing, wharfage, housing, separating into chops, weighing, average taring, furnishing landing weights, examining and turning out and in for damage, mending, laying down for private inspection, lotting, nailing down, placing in delivery pile, and delivery by land at 1s 6d

| | £ | s | d |
|---|---|---|---|
| Landing and Housing Rate ... at 1s 6d | 165,000 | 0 | 0 |
| Bulking and taring at 1s 2d | 128,333 | 0 | 0 |
| Rent.—10 weeks at 1s 2d per week ... ... | 45,833 | 0 | 0 |
| | £339,166 | 0 | 0 |

Off these gross charges the following discount is allowed to importers :—

| | |
|---|---|
| Rent at 20 per cent .. | £9,166 |
| Cost of weight notes on above quantity | £3,700 |
| Warrant stamps at 3d ... | 4,500 |
| Total weight notes and warrants | £8,2?0 |

## PLANTING NOTES.

COCONUT-PLANTING IN NORTH BORNEO.—"H. W." supplies *The Field* with an interesting paper on this subject (see page 404). Crops 3,000 of nuts from 50 trees per acre, are very good indeed ; but the soil must be rich and the growth rapid and luxuriant to justify planting so widely—usually 70 trees per acre are allowed in Ceylon. "H. W."'s figures are otherwise fairly reliable, we should say ; but he is wrong in saying that we showed the price of coconuts to have continuously increased in the last century. We can recall Ceylon coconut oil a good deal higher than it is now ; but still the present price in Colombo —R350 to R355 per ton is a very satisfactory one.

CAPACITY OF CISTERNS.—When calculating the capacity of cisterns (or tanks) 31½ gallons are estimated to one barrel and 63 gallons to one hogshead.

*A Circular Cistern One Foot in Depth.*

| | | | |
|---|---|---|---|
| Five feet diameter holds | ... | 122½ | gallons |
| Six | do | ... 176½ | do |
| Seven | do | ... 240½ | do |
| Eight | do | ... 314 | do |
| Nine | do | ... 397½ | do |
| Ten | do | ... 490½ | do |

A gallon of water weighs ten pounds, and measures 277·274 cubic inches ; a cubic foot of water contains 6·23 gallons, and weighs 62·35 pounds ; one cwt of water contains 11·2 gallons, and measures 1·8 cubic feet ; one ton of water contains 224 gallons, and measures 35·9 cubic feet. *Home paper.*

ANTS AND CATERPILLARS.—A correspondent writes :—With reference to the account which I read with mingled interest and amusement of the ant and caterpillar fight recorded in your column, I have another story in the same category to relate. In my youth, I kept silkworms, and I very well remember how I and some of my schoolfellows once put several trays of the nearly full-grown fat white grubs out of doors for a treat. When we visited them, after an hour's absence, many had disappeared from the trays. We then saw that the ants were dragging them off, several of the insects tugging in unison at each silkworm. Several of the latter had been dragged down three steps of the iron staircase on which they had been placed. I am afraid it became a favourite amusement with us to give our fattest grubs to the ants to carry, but I may say that the former were not hurt in any way by the rough means of carriage to which they were subjected.—*Daily Mail*, Oct. 27.

AN ENTERPRISING PADRE.—We believe, says the *Rangoon Gazette*, the saw mill erected by the Rev Julius Smith at Thandaung which is now cutting up one thousand shingles per day, is the first instance in the province of utilising water power for the working of a saw mill. There are, of course, numerous instances along our rivers of raising water by Means of Persian wheels. But we do not know of any other instance of wood cutting by water power than Mr Smith's and his example might profitably be followed by Burmans and Karens in cutting wood, or husking paddy wherever there are hill steamers to give the necessary power. The Pelton Water Wheel Co., of San Francisco and New York, is the system under which Mr Smith's mill is run. That it is economical and simple is shown by the fact that all the machinery and piping used at Thandung have been erected by Mr Smith with the assistance of one experienced plumber at a cost of R1,750. Of this amount, of course, a considerable portion was consumed by freight between Toungoo and Thandaung, including eleven miles up the hill.

IMPERIAL DEPARTMENT OF AGRICULTURE FOR THE WEST INDIES.—Received: General Treatment of Fungoid Pests. By Albert Howard, B A., A.R.C.S., F.L.S., F.C.S., Mycologist and Agricultural Lecturer, Imperial Department of Agriculture for the West Indies. *Preface.*—Amongst the enemies to be overcome by tropical planters the parasitic plants known as rots, moulds and mildews take a prominent place. It is impossible to ignore fungoid diseases as the aggregate loss caused by them to the sugar-cane, cacao and other industries amounts to several thousand pounds sterling annually. The object of the present pamphlet is to afford a simple and clear account of the life-history of fungi so that the injury done by them may be readily recognized and suitable remedies applied before it is too late. One of the most serviceable applications for fungoid diseases is what is known as 'Bordeaux Mixture.' Directions are given for the preparation of this (p. 37) as also for the use of knapsack and other spraying machines (pp. 38 39). Special attention is invited to the directions given on pp. 41 43 for collecting and forwarding specimens for examination by this Department. D MORRIS, Commissioner of Agriculture for the West Indies, September 10, 1902.

## Monthly Shipments of Ceylon Black Tea to All Ports in 1901-1902.

*(Compiled from Chamber of Commerce Circular.)*

| | United Kingdom. | | Russia. | | Continent of Europe. | | Australia. | |
|---|---|---|---|---|---|---|---|---|
| | 1901. lb. | 1902. lb. | 1901. lb. | 1902. lb. | 1901. lb. | 1902. lb. | 1901. lb | 1902. lb. |
| January .. | 12617540 | 9056013 | 727093 | 612958 | 104240 | 151984 | 740574 | 714247 |
| February | 8333266 | 7455219 | ... | 919709 | 135811 | 121158 | 1778987 | 1020948 |
| March ... | 7932090 | 8198179 | 1288010 | 896513 | 82055 | 91081 | 2012070 | 1713916 |
| April ... | 8474940 | 8521388 | 1297873 | 988698 | 111082 | 93198 | 2245142 | 2081904 |
| May .. | 10570686 | 9638555 | 937138 | 238239 | 63310 | 80669 | 1644160 | 2000522 |
| June ... | 11425044 | 12563050 | 835711 | 1984976 | 93699 | 166479 | 1730886 | 1828695 |
| July .. | 8488409 | 10724781 | 700557 | 1779011 | 189567 | 108785 | 2593243 | 1747960 |
| August ... | 6030406 | 7396614 | 949747 | 1065599 | 82595 | 208894 | 1612929 | 1574498 |
| September* | 6093129 | 6652202 | 485429 | 795315 | 74896 | 70262 | 1779523 | 1857897 |
| October .. | 8989024 | 6559765 | 762616 | 360844 | 181891 | 79943 | 1840192 | 1567796 |
| November | 6229472 | | 1018996 | | 190988 | | 1539370 | |
| December | 12235867 | | 830226 | | 189520 | | 990563 | |
| Total .. | 105,497,339 | | 9,699,734 | | 1,539,986 | | 20,638,208 | |

| | America. | | All Other Ports. | | Total. | |
|---|---|---|---|---|---|---|
| | 1901. lb. | 1902. lb. | 1901. lb. | 1902. lb. | 1901. lb. | 1902. lb. |
| January .. .. | 138235 | 125795 | 275598 | 389215 | 14603250 | 11050212 |
| February .. .. | 272221 | 115332 | 453774 | 385705 | 10974059 | 10018071 |
| March ... .. | 510734 | 566263 | 350874 | 311191 | 12175833 | 11777143 |
| April .. .. | 10030 | 807390 | 226776 | 290137 | 12365843 | 12782715 |
| May .. .. | 288333 | 242651 | 306644 | 436410 | 13810271 | 12637046 |
| June .. .. | 276827 | 403005 | 404687 | 714471 | 14766854 | 17660676 |
| July .. ... | 442100 | 464858 | 669163 | 846036 | 13083039 | 15671431 |
| August ... ... | 266787 | 461229 | 227578 | 678095 | 9170042 | 11384929 |
| September ... ... | 214779 | 563981 | 388213 | 688730 | 9035969 | 10628487 |
| October ... ... | 115545 | 483085 | 273928 | 655827 | 12163196 | 9707260 |
| November ... ... | 504614 | | 183124 | | 9666564 | |
| December ... ... | 313534 | | 366244 | | 14875954 | |
| Total ... | 3,704,335 | | 4,549,627 | | 145,188,244 | |

## Monthly Shipments of Ceylon Green Tea to all Ports in 1901—1902.

| | United Kingdom. | | Russia. | | Australia. | |
|---|---|---|---|---|---|---|
| | 1901. lb. | 1902. lb. | 1901. lb. | 1902. lb. | 1901. lb. | 1902. lb. |
| January ... ... | ... | 64021 | ... | .. | ... | ... |
| February ... ... | ... | 24839 | .. | 4420 | ... | ... |
| March ... ... | 75583 | 14800 | ... | 24210 | ... | .. |
| April ... ... | 13016 | 13676 | ... | 8000 | ... | ... |
| May ... ... | 33889 | 70103 | ... | .. | 1714 | .. |
| June .. ... | 12814 | 87340 | .. | 74225 | ... | ... |
| July ... ... | 4478 | 40574 | ... | .. | ... | ... |
| August ... ... | ... | 70900 | .. | .. | ... | ... |
| September ... ... | 5945 | 50771 | ... | .. | ... | ... |
| October ... .. | 12921 | 68679 | .. | .. | ... | .. |
| November .. .. | 16540 | | 5615 | .. | ... | .. |
| December .. .. | 15255 | | 38547 | .. | 1262 | .. |
| Total ... | 237,231 | | 44,162 | ... | 2,976 | ... |

| | America. | | All Other Ports. | | Total. | |
|---|---|---|---|---|---|---|
| | 1901. lb. | 1902. lb. | 1901, lb. | 1902. lb. | 1901, lb. | 1902. lb. |
| January ... | ... | 113332 | .. | ... | ... | 177353 |
| February ... | ... | 26480 | ... | 515 | .. | 56254 |
| March ... | 227889 | 62313 | 12173 | 100 | 315660 | 101423 |
| April ... | 79403 | 53610 | 7365 | 9165 | 99784 | 84451 |
| May ... | 65980 | 32676 | 1454 | 3280 | 103037 | 106059 |
| June ... | 23046 | 84184 | ... | 4500 | 35860 | 250249 |
| July ... | 46896 | 194016 | ... | ... | 51374 | 234590 |
| August ... | 12260 | 105982 | ... | 1600 | 12260 | 178482 |
| September ... | 15304 | 333704 | ... | 6800 | 21249 | 391275 |
| October ... | 28560 | 281168 | ... | .. | 41481 | 349847 |
| November ... | 36296 | .. | ... | ... | 58541 | ... |
| December ... | 11786 | ... | 7612 | ... | 27011 | .. |
| Total ... | 797,796 | ... | 28,609 | .. | 1,110,774 | ... |

* It is impossible to get the figures for the last month in time for publication; but see pages 428, 429 for certain information.

# SHARE LIST.

ISSUED BY THE

## COLOMBO SHARE BROKERS' ASSOCIATION.

### CEYLON PRODUCE COMPANIES.

| Company | paid p. sh. | Buyers. | Sellers. | Transactions. |
|---|---|---|---|---|
| Agra Ouvah Estates Co., Ltd. | 500 | — | .. | 950 |
| Ceylon Tea and Coconut Estates | 500 | .. | — | — |
| Castlereagh Tea Co., Ltd. | 100 | 90 | — | — |
| Ceylon Provincial Estates Co. Ltd. | 500 | 505 | — | — |
| Claremont Estates Co., Ltd. | 100 | — | — | — |
| Clunes Tea Co., Ltd. | 100 | .. | 65 | ... |
| Clyde Estates Co., Ltd. | 100 | ... | — | ... |
| Doomoo Tea Co., of Ceylon Ltd. | 100 | .. | — | 70 |
| Drayton Estate Co., Ltd. | 100 | — | .. | — |
| Eila Tea Co., of Ceylon, Ltd. | 100 | .. | 40 | ... |
| Estates Co of Uva, Ltd. | 500 | 250 | 300 | 275 |
| Gangawatte Tea Co., Ltd. | 100 | — | — | — |
| Glasgow Estate Co., Ltd. | 500 | .. | .. | 1100 |
| Great Western Tea Co., Ltd. | 500 | 700 | — | — |
| Hapugahalande Tea Estate Co. | 200 | 125 | 150 | — |
| High Forests Estates Co., Ltd | 500 | 525 | — | — |
| Do part paid | 400 | — | ... | ... |
| Horrekelley Estates Co Ltd | 100 | 105 | .. | ... |
| Kalutara Co., Ltd., | 500 | .. | 200 | .. |
| Kandyan Hills Co., Ltd | 100 | — | .. | — |
| Kanapediwatte Ltd. | 100 | 47½ | ... | — |
| Kelani Tea Garden Co., Ltd. | 100 | .. | 32½ | — |
| Kirklees Estate Co., Ltd. | 100 | 100 | — | — |
| Knavesmire Estates Co., Ltd. | 100 | 45 | 50 | |
| Maha Uva Estates Co., Ltd. | 500 | 400 | — | 400 |
| Mocha Tea Co., of Ceylon, Ltd. | 500 | 800 | .. | 800 |
| Nahavilla Estate Co., Ltd. | 500 | 250 | 300 | — |
| Nehoda Tea Co., Ltd. | 500 | — | ... | — |
| Palmerston Tea Co., Ltd. | 500 | ... | 400 | .. |
| Penrhos Estates Co, Ltd. | 100 | 75 | — | — |
| Pitakanda Tea Company | 500 | — | ... | — |
| Pine Hill Estate Co., Ltd. | 60 | — | — | 30 |
| Putupaula Tea Co., Ltd. | 100 | ... | .. | — |
| Ratwatte Cocoa Co., Ltd. | 500 | .. | ... | — |
| Rayigam Tea Co., Ltd. | 100 | — | — | 52½ |
| Roeberry Tea Co., Ltd. | 100 | 85 | — | — |
| Ruanwella Tea Co., Ltd | 100 | ... | 35 | — |
| St. Heliers Tea Co., Ltd, | 500 | ... | — | — |
| Talgaswela Tea Co., Ltd. | 100 | 15 | ... | — |
| Do 7 per cent Prefs. | 100 | — | — | — |
| Tonacombe Estate Co., Ltd, | 500 | 375 | — | 400 |
| Union Estate Co., Ltd. | 500 | .. | 110 | — |
| Upper Maskeliya Estates Co., Ltd. | 500 | 550 | — | — |
| Uvakellie Tea Co. of Ceylon, Ltd | 100 | 75 | 80 | 80 |
| Vogan Tea Co., Ltd., | 100 | 47½ | ... | 50 |
| Wanarajah Tea Co., Ltd. | 500 | .. | 900 | — |
| Yataderiya Tea Co., Ltd. | 100 | ... | 350 | 335 |

### CEYLON COMMERCIAL COMPANIES

| Company | paid p. sh. | Buyers. | Sellers. | Transactions. |
|---|---|---|---|---|
| Adam's Peak Hotel Co., Ltd. | 100 | ... | 30 | ... |
| Bristol Hotel Co., Ltd. | 100 | .. | 105 | 105 |
| Do 7 per cent Debts | 100 | 107 | ... | .. |
| Ceylon Gen. Steam Navigation Co., Ltd | 100 | — | 250 | .. |
| Ceylon Ice & Cold Storage Co. Ltd. | 100 | — | 110 | — |
| Ceylon Superæration Ltd. | 100 | — | — | — |
| Colombo Apothecaries' Co. Ltd. | 100 | — | 145 | — |
| Colombo Assembly Rooms Co., Ltd. | 20 | 15 | .. | — |
| Do prefs. | 20 | ... | ... | .. |
| Colombo Fort Land and Building Co., Ltd. | 100 | 80 | — | ... |
| Colombo Hotels Company | 100 | 290 | .. | — |
| Galle Face Hotel Co., Ltd. | 100 | — | 195 | 102½ |
| Kandy Hotels Co., Ltd. | 100 | .. | .. | 130 |
| Kaluganga Nav. Co. Ltd. | 70 | ... | 70 | — |
| Mount Lavinia Hotel Co., Ltd. | 500 | — | 300 | — |
| New Colombo Ice Co., Ltd. | 100 | — | 70 | — |
| Nuwara Eliya Hotels Co., Ltd. | 30 | 25 | 27½ | — |
| Do 7 per cent prefs. | 100 | — | — | — |
| Public Hall Co., Ltd. | 20 | 7½ | 10 | — |

### LONDON COMPANIES

| Company | paid. p. sh. | Buyers. | Sellers. | Transactions. |
|---|---|---|---|---|
| Alliance Tea Co., of Ceylon, Ltd. | 10 | .. | 6—7 | 6½ |
| Anglo-Ceylon General Estates Co | 100 | ... | 55—60 | — |
| Associated Estates Co., of Ceylon | 10 | .. | 1½—2½ | — |
| Do. 6 per cent prefs | 10 | .. | 3—5 | — |
| Ceylon Proprietary Co. | 1 | .. | ¼—½ | .. |
| Ceylon Tea Plantacion Co., Ltd. | 10 | .. | 23¼—24 | ... |
| Dimbula Valley Co. Ltd | 5 | .. | 5—5½ | — |
| Do prefs | 5 | — | 5—6 | ... |
| Eastern Produce & Estate Co. Ltd. | 5 | ... | 3¼—3¾ | .. |
| Ederapolla Tea Co., Ltd | 10 | ... | 6—8 | ... |
| Imperial Tea Estates Co., Ltd. | 10 | ... | 4..4½ | — |
| Kelani Valley Tea Asscn., Ltd. | 5 | ... | 3—5 | — |
| Kintyre Estates Co., Ltd. | 10 | ... | 6—8 | — |
| Lanka Plantations Co., Ltd | 10 | .. | 4 | — |
| Nahalma Estates Co., Ltd. | 1 | ... | nom | .. |
| New Dimbula Co., Ltd. | 1 | ... | 2¾—3 | .. |
| Nuwara Eliya Tea Estate Co., Ld, | 10 | — | 9¾ | — |
| Ouvah Coffee Co., Ltd. | 10 | ... | 6—7 | — |
| Ragalla Tea Estates Co., Ltd. | 10 | . | 11—13 | — |
| Scottish Ceylon Tea Co., Ltd. | 10 | – | 10—15 | — |
| Spring Valley Tea Co., Ltd. | 10 | ... | 2—5 | — |
| Standard Tea Co., Ltd. | 6 | .. | 10—12 | .. |
| The Shell Transport and Trading Company, Ltd. | 1 | ... | 1½—1¾ | ... — |
| Ukuwella Estates Co., Ltd. | 25 | — | par | ... |
| Yatiyantota Ceylon Tea Co., Ltd. | 10 | — | 5¼ | .. |
| Do. pref. 6 o/o | 10 | ... | 9—10 | ... |

BY ORDER OF THE COMMITTEE.

Colombo, Dec. 5th, 1902.

* Latest London P ices

## RAINFALL RETURN FOR COLOMBO.

(*Supplied by the Surveyor-General.*)

| | 1897. | 1898. | 1899 | 1900 | 1901 | Av. of 32yrs. | 1902 |
|---|---|---|---|---|---|---|---|
| | Inch | Inch | Inch. | Inch. | Inch. | Inch. | Inch |
| January .. | 3·81 | 2·32 | ·98 | 3·72 | 11·91 | 3·51 | 1·95 |
| February .. | 1·68 | 1·98 | 2·78 | 0·63 | 3·55 | 1·94 | 4·57 |
| March .. | 3·66 | 4·21 | 0·88 | 3·71 | 5·12 | 4·76 | 6·85 |
| April .. | 10·97 | 22·81 | 6·66 | 15·12 | 8·71 | 11·34 | 10·01 |
| May .. | 8·30 | 5·80 | 17·73 | 10·63 | 6·28 | 11·86 | 11·89 |
| June .. | 10·14 | 10·94 | 9·23 | 7·83 | 5·93 | 8·28 | 9·84 |
| July .. | 5·24 | 6·15 | 1·11 | 6·77 | 4·52 | 4·46 | 4·63 |
| August .. | 9·09 | 0·97 | 0·62 | 7·35 | 0·46 | 3·68 | 2·78 |
| September .. | 4·58 | 6·90 | 1·48 | 4·00 | 3·93 | 4·94 | 3·18 |
| October ... | 4·71 | 20·60 | 12·99 | 9·47 | 3·91 | 14·03 | 31·47 |
| November .. | 11·66 | 17·38 | 8·58 | 9·25 | 19·84 | 12·77 | 20·10* |
| December .. | 8·89 | 3-05 | 4·44 | 5·20 | 1·70 | 6·26 | 2·45 |
| Total.. | 82·73 | 103·11 | 73·48 | 83·68 | 75·86 | 87·83 | 114·72 |

* From 1st to 3rd Dec. 2·45 inches, that is up to 9·30 a.m. on the 4th Dec.—ED. *C.O.*

## CEYLON TEA: MONTHLY SHIPMENTS TO UNITED KINGDOM AND ESTIMATE.

Estimate for Nov. 1902—7½ to 8 mill. lb.

Total Shipments Do 1902—6,250,000 lb.

Do Do Do 1901—6,229,472 lb.

Do Do Do 1900—9,468,060 lb.

[ESTIMATE for Dec. 1902—9½ to 10 million lb.]

## COLOMBO PRICE CURRENT.

*(Furnished by the Chamber of Commerce.)*

EXPORTS

Colombo, Dec. 1st, 1902.

CARDAMOMS :—
All round parcel, well bleached per lb. R1·20
Do. dull medium do. R1·00
Special assortment, 0 and 1 only do. R1·35
Seeds do. R1·05

CINCHONA BARK :—
Per unit of Sulphate of Quinine 6c—1½ to 3 per cent.

CINNAMON :—(in bales of 100 lbs. nett.)
Ordinary assortment per lb. 50c. } Nominal.
Nos. 1 and 2 only per lb. 56c. }
Nos. 3 and 4 only per lb. 44c. }

CINNAMON CHIPS :—(in bgs. of 56 lbs. nett. per candy of 560 lb.) R62·50

COCOA :—
Finest estate red unpicked per cwt R50·00
Medium do do do R40·00
Bright native unpicked and undried R35·00
Ordinary do do do R25·00

COCONUTS—(husked)
Selected per thousand R50·00
Ordinary ,, R42·00
Smalls ,, R35·00

COCONUT CAKE—
Poonac in robins f. o. b. per ton R80·00
Do in bags none.

COCONUT (Desiccated).
Assorted all grades per lb 20c.

COCONUT OIL—
Dealers' Oil per cwt R16·50.
Coconut Oil in ordinary packages f. o. b. per ton R370·00.—Nominal.

COFFEE.—
Plantation Estate Parchment on the spot per bus. None
Plantation Estate Coffee f. o. b. (ready) per cwt.—R62·00.
Native Coffee, f.o.b per cwt.—None.

CITRONELLA OIL—
Ready do per lb.—50c. Firm.

COPRA—
Boat Copra per candy of 560 lb. R52·50
Calpentyn Copra do do R52 50
Cart do do do R47·00
Estate do do do R52 50

CROTON SEED per cwt—R11·00

EBONY—
Sound per ton at Govt. depot R70·00 to 145·00—Sales of this day.
Inferior R35·00 to 100·00.

FIBRES—

| | | | |
|---|---|---|---|
| Coconut Bristle | No 1 | per cwt | None |
| Do | ,, 2 | | None |
| Do mattress | ,, 1 | | None |
| Do | ,, 2 | | None |
| Coir Yarn, Kogalla | ,, 1 to 8 | | R16·00 |
| Do Colombo | ,, 1 to 8 | | R11·00 |
| Kitool all sizes | | | None |
| Palmyrah | | | None |

PEPPER—Black per lb None

PLUMBAGO—

| | | |
|---|---|---|
| Large lumps | per ton | R600 |
| Ordinary lumps | do | R600 |
| Chips | do | R350 |
| Dust | do | R250 Prices nominal Fine qualities scarce. |
| Do (Flying) | do | R125 |

SAPANWOOD— per ton R45.—Nominal.

SATINWOOD (ordinary) per cubic ft. R4·00
Do (Flowered) per cubic ft. R11·10

| TEA— | High Grown Average | Medium Average. | Low Grown Average. |
|---|---|---|---|
| Broken Pekoe and Broken | cts | cts | cts |
| Orange Pekoe per lb | 59 | 48 | 41 |
| Orange Pekoe do | 49 | 42 | 35 |
| Pekoe do | 44 | 36 | 32 |
| Pekoe Souchong do | 41 | 31 | 30 |
| Pekoe Fannings do | 41 | 30 | 27 |
| Broken mixed—dust, &c | 29 | 23 | 25 |

## CEYLON EXPORTS ADN DISTRIBUTION FOR SEASONS 1901 AND 1902.

| COUNTRIES | Black Tea 1902 lbs. | Black Tea 1901 lbs. | Green Tea 1902 lbs. | Green Tea 1901 lbs. | Coffee—cwts. Plantation | Coffee—cwts. N'tive | Coffee—cwts. Total | Cocoa cwts. | C'moms lbs. | Cinnamon Bales. lbs. | Cinnamon Chips. lbs. | Coconut Oil 1902 cwt | Coconut Oil 1901 cwts | Copra cwts. | Desiccated Coconut lb. | Poonac. cwts. | Coconuts. No. | Plumbago 1902 cwts | Plumbago 1901 cwts. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| To U K. .. | 91937443 | 93506160 | 587050 | 180510 | 7675 | .. | 7675 | 32222 | 335307 | 342762 | 152397 | 260467 | 2 7377 | 12908 | 8145766 | 21 | 8875916 | 127644 | 180154 |
| ,, Austria .. | 49553 | 48896 | .. | .. | 1 | ... | 1 | ... | ... | 5600 | 38640 | 21255 | 8636 | 13364 | 143300 | ... | 12510 | ... | .. |
| ,, Belgium .. | 81501 | 17741 | ... | .. | 143 | ... | 143 | 497 | 50 | 103700 | 172171 | 3905 | 5672 | 22944 | 338590 | 93109 | 233400 | 15352 | 19749 |
| ,, France .. | 201431 | 251042 | ... | .. | 4 | ... | 4 | 940 | 448 | 55500 | 59534 | 238 | 802 | 103601 | 33200 | ... | 96020 | 1414 | 395 |
| ,, Germany .. | 588795 | 489742 | ... | .. | 26 | .. | 26 | 3795 | 94971 | 778[illegible]39 | 453809 | 12545 | 11162 | 157118 | 1901290 | 121947 | 1137850 | 61098 | 46481 |
| ,, Holland ... | 4514 | 19041 | ... | .. | ... | .. | .. | .. | .. | 47000 | 208600 | .. | 3716 | 476 | 319070 | .. | 24415 | 1155 | 202 |
| ,, Italy .. | 19213 | 13534 | .. | .. | ... | .. | .. | 32 | 1035 | 214958 | 216944 | 5045 | 8713 | ... | ... | 10 | 11285 | 1[illegible]24 | 100 |
| ,, Russia .. | 11314168 | 8779508 | 127115 | 5615 | 8 | ... | 8 | 100 | 448 | 130 | .. | 181 | 134 | 33136 | .. | .. | ... | 1678 | 3713 |
| ,, Spain .. | 3281 | 25[illegible] | .. | .. | ... | .. | .. | 31 | .. | 284902 | 111156 | .. | .. | ... | 27000 | .. | ... | .. | ... |
| ,, Sweden .. | 73725 | 53298 | ... | .. | .. | .. | .. | 4[illegible]0 | 2014 | .. | .. | 1129 | 199 | ... | 90380 | .. | 15120 | 433 | 204 |
| ,, Turkey .. | 36463 | 37582 | .. | .. | ... | ... | .. | .. | .. | 112 | ... | ... | ... | .. | ... | ... | .. | .. | ... |
| ,, India .. | 791294 | 1068640 | 26970 | 16124 | 89 | ... | 89 | 7 | 97833 | .. | 2296 | 62140 | 122273 | 5 | 1950 | ... | 149500 | 1949 | 506 |
| ,, Australia .. | 17141413 | 19548559 | .. | 1714 | 2009 | 14 | 1695 | 537 | ... | 4674 | 34248 | 5 | 197 | ... | 748325 | 221 | 1944 | 388 | 537 |
| ,, America ... | 4489273 | 2529817 | 1612613 | 488544 | 820 | ... | 820 | 7 | 7039 | 393340 | 28675 | 85185 | 20955 | ... | 2097790 | ... | 102021 | 233694 | 151122 |
| ,, Africa .. | 510810 | 326383 | 1200 | ... | 15 | .. | 15 | .. | 2726 | .. | .. | 218 | 76 | .. | 55960 | 1 | 1119041 | ... | ... |
| ,, China ... | 4117102 | 2606770 | 6340 | 4853 | 48 | .. | 48 | 100 | 7548 | 16200 | 112 | 846 | 1114 | .. | 1918 | .. | .. | 797 | ... |
| ,, Singapore ... | 188599 | 126514 | ... | ... | 1 | ... | 1 | 5701 | 2240 | ... | .. | 1029 | 3006 | ... | ... | ... | ... | ... | .. |
| ,, Mauritius . | 67309 | 44126 | .. | ... | 280 | .. | 280 | .. | .. | .. | .. | ... | ... | ... | ... | .. | .. | .. | .. |
| ,, Malta .. | 265186 | 274433 | .. | ... | ... | ... | .. | ... | .. | ... | .. | .. | .. | .. | ... | .. | .. | ... | ... |
| Total export from 1st Jan to 1st Dec. 1902. | 131881373 | 129742036 | 2361283 | 697360 | 11105 | 14 | 11119 | 44360 | 551659 | 2247417 | 1483582 | 454188 | 394022 | 343552 | 14204539 | 215309 | 11779022 | 445626 | 402670 |

## MARKET RATES FOR OLD AND NEW PRODUCTS.

*(From Lewis & Peat's Fortnightly Price Current, London, 5th November, 1902.)*

| | QUALITY. | QUOTATIONS. |
|---|---|---|
| ALOES, Soccotrine cwt. | Fair to fine dry .. | 70s a 80s |
| Zanzibar & Hepatic ,, | Common to good .. | 20s a 60s |
| ARROWROOT (Natal) lb. | Fair to fine .. | 7d a 8d |
| BEES' WAX, cwt. | | |
| Zanzibar & Bombay { White ,, | Dingy to Fair | £5 a £6 12s 6d |
| Yellow ,, | Fair ,, | £6 a £6 12s 6d |
| Madagascar ,, | Dark to good palish | £6 a £6 12s 6d |
| CAMPHOR, Formosa ,, | Crude and semi-refined | 16[illegible]s a 17[illegible]s |
| Japan ,, | Fair average quality .. | 16[illegible]s |
| CARDAMOMS, Malabar lb | Clipped, bold, bright, fine | 1s 9d a 2s |
| | Middling, stalky & lean | 1s a 1s 7d |
| Ceylon.—Mysore ,, | Fair to fine plump .. | 1s a 3s 0d |
| | Seeds .. | 1s 3d a 1s 7d |
| ,, Tellicherry ,, | Good to fine .. | 1s 6d a 2s |
| | Brownish . | 1s 3d a 1s 6d |
| ,, Long ,, | Shelly to good .. | 9d a 2s |
| ,, Mangalore ,, | Med brown to good bold | 2s 8d a 2s 11d |
| CASTOR OIL, Calcutta ,, | 1sts and 2nds .. | 2⅛d a 2⅜d |
| CHILLIES, Zanzibar cwt. | Dull to fine bright ... | 35s a 42s 6d |
| CINCHONA BARK.—lb. Ceylon | Ledgeriana Orig. Stem | 6d a 9d |
| | Crown, Renewed | 5d a 7d |
| | Org. Stem | 2½d a 6½d |
| | Red Org. Stem | 2½d a 4½d |
| | Renewed | 3d a 5¾d |
| | Root | 3¾d a 4d |
| CINNAMON, Ceylon 1sts per lb. | Ordinary to fine quill | 8½d a 1s 6d |
| 2nds | ,, ,, | 8d a 1s 6d |
| 3rds | ,, ,, | 7½d a 1s 4d |
| 4ths | ,, ,, | 7d a 11d |
| Chips | ,, ,, | 2½d a 10d |
| CLOVES, Penang lb. | Dull to fine bright bold | 5½d a 1s |
| Amboyna .. | Dull to fine | 5d a 6d |
| Zanzibar and Pemba | Good and fine bright | 4⅜d a 4½d |
| | Common dull to fair | 4d a 4 5-16d |
| Stems .. | Fair | 2d |
| COFFEE | | |
| Ceylon Plantation ,, | Bold to fine bold colory | 92s 6d a 118s |
| | Middling to fine mid .. | 80s a 105s 6d |
| | Smalls | 55s a 69s |
| Native | Good ordinary | 40s a 50s |
| Liberian ,, | Small to bold | 30s a 40s |
| COCOA, Ceylon ,, | Bold to fine bold | 65s a 88s |
| | Medium and fair | 58s a 64s |
| | Native | [illegible]s a 60s |
| COLOMBO ROOT ,, | Middling to good | 13s a 20s |
| COIR ROPE, Ceylon ton | | nominal |
| Cochin ,, | Ordinary to fair .. | £13 10s a £18 |
| FIBRE, Brush ,, | Ord. to fine long straight | £16 a £19 |
| Cochin ,, | Ordinary to good clean | £20 a £24 |
| Stuffing ,, | Common to fine | £7 a £9 |
| COIR YARN, Ceylon ,, | Common to superior | £15 a £30 |
| Cochin ,, | ,, ,, very fine | £12 a £32 |
| do. ,, | Roping, fair to good | £10 a £14 10s |
| CROTON SEEDS, sift. cwt. | Dull to fair | 15s a 25s |
| CUTCH ,, ,, | Fair to fine dry | 25s a 30s |
| GINGER, Bengal, rough ,, | Fair | [illegible]0s |
| Calicut, Cut A ,, | Good to fine bold | [illegible]0s a 85s |
| B & C ,, | Small and medium | 46s a 60s |
| Cochin Rough ,, | Common to fine bold | 36s a 40s |
| | Small and D's | 34s a 35s |
| Japan ,, | Unsplit | 33s a 34s |
| GUM AMMONIACUM ,, | Sm. blocky to fine clean | 10s a 35s |
| ANIMI, Zanzibar ,, | Picked fine pale in sorts | £10 7s 6d a £16 |
| | Part yellow and mixed | £7 a £10 |
| | Bean and Pea size ditto | £70 a £8 15s |
| | Amber and dk. red bold | £5 15s a £8 |
| | Med. & bold glassy sorts | 90s a £7 17s 6d |
| Madagascar, | Fair to good palish ... | £4 a £8 |
| | ,, ,, red ... | £4 5s a £7 10s |
| ARABIC E. I. & Aden ,, | Ordinary to good pale | 25s a 37s 6d |
| Turkey sorts ,, | | 30s a 37s 6d |
| Ghatti ,, | Pickings to fine pale ... | 10s a 2[illegible]s |
| Kurrachee ,, | Good and fine pale ... | 27s 6d a 30s |
| | Reddish to pale selected | 10s a 25s |
| Madras ,, | Dark to fine pale ... | 18s a 25s |
| ASSAFŒTIDA ,, | Clean fr. to gd. almonds | 45s a 75s |
| | Ord. stony and blocky | 9s a 37s 6d |
| KINO ,, | Fair to fine bright | 4½d a 7d |
| MYRRH, picked ,, | Fair to fine pale | 75s a 120s |
| Aden sorts ,, | Middling to good | 50s a 70s |
| OLIBANUM, drop ,, | Good to fine white | 42s a 47s 6d |
| | Middling to fair | 28s a 42s |
| pickings ,, | Low to good pale | 18s a 26s |
| siftings ,, | Slightly foul to fine | 18s a 23s |
| INDIARUBBER, Ceylon | Fine (grwn. fr. Para seed) | 2s 3d a 2s 10¾d |
| Assam | Good to fine | 2s a 2s 3d |
| | Common to foul & mxd. | 7d a 1s 6d |
| Rangoon | Fair to good clean ... | 2s a 2s 3d |
| Borneo | Common to fine | 6d a 2s 2d |

| | QUALITY. | QUOTATIONS |
|---|---|---|
| INDIARUBBER (Contd.) | | |
| Java, Sing. & Penang lb. | Foul to good clean .. | 8d a 2s 2½d |
| Mozambique ,, | Good to fine Ball ... | 2s 6d a 2s 9d |
| | Ordinary to fair Ball ... | 1s 10d a 2s 2d |
| | Low sandy Ball ... | 9d a 1s 6d |
| | Sausage, fair to good .. | 1s 10d a 2s 7½d |
| | Liver and Livery Ball .. | 1s 9d a 2s 3¾d |
| Nyassaland | Fair to fine ball .. | 2s 3d a 2s 8d |
| Madagascar | Fr to fine pinky & white | 2s a 2s [illegible]d |
| | Fair to good black .. | 1s 1d a 1s 6½d |
| | Niggers, low to fine .. | 7d a 1s 9½d |
| INDIGO, E.I | Bengal— | |
| | Shipping mid to gd violet | 3s 8d a 4s |
| | Consuming mid. to gd. | 3s 2d a 3s 7d |
| | Ordinary to mid. | 2s 8d a 3s 1d |
| | Mid. to good Kurpah | 1s 9d a 2s 3d |
| | Low to ordinary | 1s a 1s 7d |
| | Mid. to good Madras | 1s 4d a 1s 10d |
| MACE, Bombay & Penang per lb. | Pale reddish to fine | 2s a 3s |
| | Ordinary to fair | 1s 4d a 1s 11d |
| | Pickings | 1s 3d a 1s 4d |
| MYRABOLANS, Madras } cwt | Dark to fine pale UG | 5s a 6s |
| | Fair Coast | 4s 3d a 4s 6d |
| Bombay ,, | Jubblepore | 4s 6d a 6s |
| | Bhimlies | 4s a 7s |
| | Rhajpore, &c. | 3s 6d a 5s 6d |
| Bengal ,, | Calcutta | 3s 6d a 5s |
| NUTMEGS— lb. | 64's to 57's | 2s 6d |
| Bombay & Penang ,, | 110's to 65's | 1s 1d a 2s 5½d |
| | 160's to 115's | 6d a 1s |
| NUTS, ARECA cwt. | Ordinary to fair fresh | 14s a 18s |
| NUX VOMICA, Bombay per cwt. | Ordinary to middling | 5s 6d a 6s |
| Madras | Fair to good bold fresh | 7s a 10s |
| | Small ordinary and fair | 5s a 6s 9d |
| OIL OF ANISEED ,, | Fair merchantable | 4s 9d a 4s 10½d |
| CASSIA ,, | According to analysis | 3s 3d a 3s 6d |
| LEMONGRASS ,, | Good flavour & colour | 5d |
| NUTMEG ,, | Dingy to white | 1½d a 2½d |
| CINNAMON ,, | Ordinary to fair sweet | 3¼d a 1s 1d |
| CITRONELLE ,, | Bright & good flavour | 9d a 10½d |
| ORCHELLA WEED—cwt | | |
| Ceylon ,, | Mid. to fine not woody.. | 10s a 12s 6d |
| Zanzibar. ,, | Picked clean flat leaf .. | 10s a 14s |
| | ,, wiry Mozambique | 10s a 11s |
| PEPPER—(Black) lb | | |
| Alleppee & Tellicherry | Fair to bold heavy .. | 6d a 6¼d |
| Singapore .. | Fair ... ... .. | 6 1-16d |
| Acheen & W. C. Penang | Dull to fine ... ... | 5⅛d a 5⅝d |
| PLUMBAGO, lump cwt. | Fair to fine bright bold | 30s a 35s |
| | Middling to good small | 20s a 28s |
| chips | Dull to fine bright .. | 9s a 15s |
| dust | Ordinary to fine bright | 4s a 7s 6d |
| SAFFLOWER | Good to fine pinky . | 65s a 75s |
| | Inferior to fair . | 40s a 60s |
| SANDAL WOOD— | | |
| Bombay, Logs ton. | Fair to fine flavour .. | £15 a £30 |
| Chips ,, | ... ... ... .. | £5 a £8 |
| Madras, Logs ,, | Fair to good flavour .. | £15 a £30 |
| Chips ,, | Inferior to fine ... | £4 a £8 |
| SAPANWOOD Ceylon ,, | Fair to good .. | £5 a £5 10s |
| Manila ,, | { Rough & rooty to good | £4 10s a £5 15s |
| Siam ,, | bold smooth... | £7 |
| SEEDLAC cwt. | Ord. dusty to gd. soluble | 115s a 117s 6d |
| SENNA, Tinnevelly lb. | Good to fine bold green | 5½d a 8d |
| | Fair greenish | 3½d a 5¼d |
| | Common dark and small | 1¼d a 3d |
| SHELLS, M. o'PEARL— | | |
| Bombay cwt. | Bold and A's } | |
| | D's and B's } | 48s a 120s |
| | Small ... } | |
| Mergui ,, | Small to bold .. | £7 15s a £10 |
| Mussel ,, | Small to bold ... | 17s a 55s |
| TAMARINDS, Calcutta... | Mid. to fine bl'k not stony | 8s a 10s |
| per cwt. Madras | Stony and inferior .. | 4s 6d a 6s |
| TORTOISESHELL— | | |
| Zanzibar & Bombay lb. | Small to bold dark mottle part heavy | 18s a 24s |
| TURMERIC, Bengal cwt. | Fair ... | 14s a 16s |
| Madras ,, | Finger fair to fine bold bright | 10s a 14s |
| | Bulbs .. | 9s |
| Do. ,, | Finger .. | 10s a 12s |
| Cochin ,, | Bulbs .. | 9s a 9 6d |
| VANILLOES— lb. | | |
| Mauritius .. } 1sts | Gd. crysallized 3½ a 8½ in | 6s a 25s 6d |
| Bourbon ... } 2nds | Foxy & reddish 3½ a 8 ,, | 4s a 18s |
| Seychelles 3rds | Lean and inferior ... | 3s a 5s |
| VERMILION lb. | Fine, pure, bright .. | 3s a 3s 1d |
| WAX, Japan, squares cwt | Good white hard ... | 57s 6d a 60s |

THE
# AGRICULTURAL MAGAZINE,
COLOMBO.
*Added as a Supplement Monthly to the "TROPICAL AGRICULTURIST."*

The following pages include the Contents of the *Agricultural Magazine* for December :—

Vol. XIV.] DECEMBER, 1902. [No. 6.

## SCHOOL GARDENS.

WE shall now proceed to consider the educational side of School Gardens. To understand their value as a means of imparting knowledge, we must think of them as a field for Nature Study.

By Nature Study is meant the study of the world around us, as seen in animate and inanimate nature. Every natural object, whether bird of butterfly, plant or flower, rock or steam, has a story to tell us, and it is the object of Nature Study to enable the child to learn the story of every object that presents itself to the eye. It may truly be said of the generality of children that seeing, they see not, since they look with what may be termed the external eye and not with that inward eye that the poet speaks of. What they see passes before them like a panorama—a mere succession of pictures—suggesting nothing to the mind. Many people go through life with the idea that they are leading a kind of separate existence, having nothing in common with other natural objects around them. They know nothing of the interdependence which binds everything in this world together as elements in a universal and marvellously designed whole. Such ignorance it is that begets self-conceit and self-love. On the other hand the student of Nature knows his own worth, and shows us what true humility is.

To know more about Nature, to understand the function of each natural object in the world's economy, is to put by in the mind a rich store of associations that should always supply the child with healthy mental exercise and leave no room for idle thoughts. How familiar is the vacant look indicative of the mind that has no food for thought! Under ordinary systems of education the constant application to the written page brings about a revulsion of the mind, resulting in temporary mental apathy, or, what may perhaps be better termed, mental atrophy.

In Nature Study we see the direct opposite of ordinary methods of teaching. Instead of principles and rules the student deals directly with objects and phenomena, and, by observation and comparison, deduces in an intelligent, and indeed the only satisfactory manner, those truths, which when acquired merely as facts, are so much dead knowledge. In this way are grasped the principles which underlie natural science.

A habit which is acquired in youth is, as we all know, difficult to give up. So that if we are helping to inculcate the habit of observing, to evoke an interest in natural objects—a love of gardening—a respect for order and method—an appreciation of the dignity of labour, and the other concomitant advantages derived from the new system of instruction, then we are surely performing a valuable service to future generations.

## OCCASIONAL NOTES.

A gentleman who has grown cotton experimentaly in the Henaratgoda district is good enough to give us his experience in the following note :—"I grew two varieties, viz., the Egyptian and South Sea Island, both good, and I succeeded fairly well and had good crops, but the rats and squirrels made sad havoc of the pods before they came to perfection, and the heavy rainfall just as the pods were ripening damaged the remainder of the crop. I should think it ought to do well in the Jaffna and Batticaloa districts."

The above shows that one of the chief things to be discovered about cotton growing is the proper time to plant, so as to get the crop in at the proper season. As regard rats,—so destructive to arrowroot and ground-nut as well —the only means of dealing with then is by poison baits. We learn that "Rough on Rats" has been used with great success in destroying rats on coconut trees in the Veyangoda district.

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The "Life Tree of Jamaica" is said to grow for months after uprooting. Does this mean that its leaves do not wither, or that it grows in the sense of putting out a fresh growth of leafy shoots. If the latter, we have seen a cut log of *Ablizzia orodatissima* (Suriya mara) growing most vigorously for months, producing tuft-like leafy shoots. If the former, then we might call our common Plumeria (temple flower) the life-tree of Ceylon, owing to its wonderful tenacity for life, which enables it to keep its leaves green and blossoms fresh even when out of the soil, if left in the shade. Indeed, we have been told (with what truth we do not know) that the temple tree is emblematic of immortality among the Buddhists. Anyhow it is one of the chosen flowers used as offerings in the temples.

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*Cassia Beareana* is the name of a plant reported to have greater medicinal virtues than quinine in curing malarial fever. Mr. Thos. Christy, writing to the "*Ceylon Observer*," says that quinine is being abandoned in favour of the extract from *Cassia Beareana*, supplies of which are said to be carried by those going out to the East and West Coasts of Africa, and Central Africa. We understand that the *Lancet* has written in favour of the drug.

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The production of fruits from the roots of the Jak (lately discussed in the local press) is referred to in the article on the Jak tree. In the General Items column will be found a reference to the tendency of the plantain to bear fruit nearer the ground than usual.

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In the account of a remarkable tree, reference is made to the extraordinary properties of *Litsea chinensis* in the setting of broken bones. We are informed by Mr. W. A. De. Silva that the same wonderful medicinal (or shall we say surgical) powers are also possessed by another common plant, namely, the Loranthus (Sin. *Pilila*). It would appear that all parts of the tree are taken together and prepared in the form of a "mellun" for application as a poultice for the space of about twenty minutes (and not much longer than that.) Those who employ this medicinal agent are said to be particular as to the host from which the parasitic *Loranthus* is obtained, as the potency of the drug is believed to vary with the host!

## RAINFALL TAKEN AT THE SCHOOL OF AGRICULTURE DURING THE MONTH OF NOVEMBER, 1902.

| | | | | | |
|---|---|---|---|---|---|
| 1 | Saturday | 5·43 | 17 | Monday | Nil |
| 2 | Sunday | 07 | 18 | Tuesday | ·13 |
| 3 | Monday | ·34 | 19 | Wednesday | ·82 |
| 4 | Tuesday | Nil | 20 | Thursday | ·68 |
| 5 | Wednesday | ·05 | 21 | Friday | ·10 |
| 6 | Thursday | 3·26 | 22 | Saturday | ·11 |
| 7 | Friday | ·22 | 23 | Sunday | Nil |
| 8 | Saturday | ·17 | 24 | Monday | ·22 |
| 9 | Sunday | ·38 | 25 | Tuesday | ·02 |
| 10 | Monday | 1·45 | 26 | Wednesday | Nil |
| 11 | Tuesday | ·28 | 27 | Thursday | ·25 |
| 12 | Wednesday | 1·12 | 28 | Friday | Nil |
| 13 | Thursday | Nil | 29 | Saturday | 1·50 |
| 14 | Friday | Nil | 30 | Sunday | ·30 |
| 15 | Saturday | 3·85 | 1 | Monday | ·30 |
| 16 | Sunday | ·04 | | | |
| | | | | Total... | 15·66 |
| | | | | Mean... | ·52 |

Greatest amount of rainfall registered in 24 hours, on 15 November 1902, 3·85 inches.

Recorded by ALEX. PERERA.

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## A REMARKABLE TREE.

If all that is said of *Litsea chinensis*, the Sinhalese *Bomi* and Tamil *Ellumpurukki* is correct. this is certainly a very remarkable tree. Trimen in this Flora says no more than that "the wood is used for house-building; bark glutinous, and used medicinally as an external application for bruises, &c."

The following extract from Ferguson's "All about Fibres, Drugs, &c." gives an account of its medicinal properties:—"There is a tree growing in Patchalapalla district, in the Northern Province, the name of which is Elamborekka, literally translated 'bone-setter.' The medicinal properties lie in the bark, and the native doctors are accustomed to apply the pounded drug in the shape of a poultice to a broken limb, for the space of about 20 minutes, or, as they calculate, for the time a pot of rice takes to boil, when it is removed and the limb bound up, in the confident expectation that the several parts will unite without further trouble. Fabulous stories are told, as a matter of course, of the virtues of this remedy, but a case came under my own observation which may as well be stated. A Sinhalese aged about fifty was brought to Mr. Simon Casie Chetty, late Judge of Chilaw, having been picked up on the roadside, where he was left by robbers. They had beaten him with sticks till his arm was smashed from shoulder to wrist, and the Judge was for calling in at once the Sub-Assistant Surgeon, but the man declined the offer with somewhat of scorn. He was, he said, a vederale (doctor) himself, and could get his arm right. Fortunately for him there happened to be a solitary Elamborekka tree in the jail compound, and he had the bark of it applied in the manner above detailed. It seemed impossible that he could escape am-

putation, but two months afterwards he was in the field superintending his labourers with a sound and apparently strong-limb. For the truth of this statement I can vouch, having seen the battered arm, and also seen the man after recovery."

The name of the above authority is not stated, but we may take it for granted that the account is perfectly reliable, seeing that it has been accepted by the Editors.

Dr. Watt, in his Dictionary of Economic Products of India, makes reference to *Litsea chinensis*, stating that the bark, which is feebly balsamic and mucilagenous, is one of the best known and most popular native drugs. In India, besides being employed as a demulcent and mild astringent in diarrhœa and dysenery, it is said to be used fresh ground with water or milk as an emolient and applied to bruises, as well as a styptic for wounds. Further, we are told that it is a local anodyne for venomous bites. (Watt mentions that *L. zeylanica*, our "wild Cinnamon" and the Sinhalese dawulkurundu [is also used for snake bite.) The oil from berries *L. chinensis* is employed in India as an ointment for rheumatism, while in China and Java candles are made from it.

Mr. E. Hoole, of Kandy, is good enough to write to us with reference to this tree:—The tree is found growing in the Peradeniya Botanic Gardens, and the coolies there seem to be aware of its medicinal properties. The bark, which is glutinous, is used as an external application to bruises and fractures—generally after being made into a poultice with the flour of kurakkan (*Eleusine coracana*).

In the list of drugs (with their uses) prepared for the Paris Exhibition, this tree is referred to, and it is stated that the bark is used in dislocations; also in bruises to produce dispersion of extravasated blood.

Dr. O'Shaughnessy, in his Bengal Dispensatory and *Pharmacopœa* (1841) speaks of the bark as a favourite application to bruises and wounds. Here then is a tree the medicinal properties of which are well worthy the attention of local medical men. As a means of studying native treatment we would go the length of advocating the appointment of a recognised "Vederale" as a "Professor of Native Medicine" on the staff of the Medical College! A specimen of *Litsea chinensis* may be seen in the grounds of the late School of Agriculture, Flower Road.

## PRICKLY-PEAR AS FOODER FOR CATTLE DURING SCARCITY.

We seem to have overlooked what is a decidedly useful report on the value of Prickly-pear as a "Famine Food" for Cattle. The use of this otherwise pestiferous weed for feeding stock has been the subject of a good deal of discussion in agricultural papers, but a report founded on actual experiment in India gives us all the information we could desire as to the possibilities of the plant as a fodder under tropical conditions.

The Prickly-pear (*Opuntia Dillenii*) is generally known as the "Cactus," and is not so common in the moist as in the dry districts, where it occurs in abundance near the coast. It is called "Katu-pathok" by the Sinhalese, and "Naka-kali" by the Tamils. In the Northern Province, where it is said to be a nuisance, there should be abundant opportunity for repeating, if necessary, the trial of the plant as a fodder in times of drought.

The Director of Land Records and Agriculture, Bombay, referring to the use of Prickly-pear as food for milch cows says:—"The experiment of feeding pampered milch cattle was a failure. Their milking qualities could not be kept up. . . . The animals, however, ate enough of the pears to prove that they could be kept alive on it."

We might, therefore, omit any further reference to its use for feeding milking stock, for indeed it is not for such animals that the question of a famine fodder arises. But the following details given by the Superintendent of Farms, Bombay, are worth carefully reading:—

I have the honour to report that the experiment directed by you to test the value of prickly-pear as a cattle food, has been completed. I am glad to be able to report favourably as to its undoubted value as an *auxiliary* cattle food in famine times.

An experiment was begun on the 19th February at the Poona Farm which did not prove satisfactory. An attempt was made to feed a cow and buffalo, both in milk, on it. These cattle, although not yielding much milk at the time, were previously liberally rationed, and naturally did not take kindly to the change. They had iterally to be starved before either the one or the other would taste the pear. The pear was chopped very fine, mixed with dàl husk, bran, and a little salt. The buffalo took the food first, but only after 30 hours' stinting. Neither the cow nor buffalo ate it greedily. The experiment was continued four days. Meantime, the cow gave milk regularly, but only about one-fourth of her usual quantity. The buffalo got irritable, then savage, and refused to give any milk at all. The cow when allowed her ordinary food soon gave her usual quantity of milk. The buffalo has since given less than her normal yield, and is now nearly dry. However, it is proved that milch cattle in high condition can, by severe stinting be made to eat prickly-pear.

On the 26th February an experiment was begun at the old Botanical Gardens, Ganesh Khind, with three cattle ranging in age from 18 months to 2 years. The condition and feeding of these cattle did not differ from ordinary rayats' stock. They had previously been allowed a fair allowance of hay at night, and were grazed on rather bare pasture during the day. They were all in fair thriving condition. Two were buffalo heifers, the third was a young bull out of a small Deccani cow. Their aggregate weights were 942 lbs. The experiment was continued 32 days.

The implements used, in preparing the pear, were identical with those sold in Bellary at 2 annas per set. The set consists of a rude hoop iron knife, a hoop iron tongs, and a pair of pincers fashioned like a sugar tong. Each limb

of the latter terminates in a spoon. This implement is the most serviceable of the three. The two spoons, when closed over a bunch of prickles, readily remove the bunch along with a small portion of the pulpy part of the leaf. It requires very little practice to get into the knack of removing the prickles quickly. It is waste of time to attempt to pull the prickles. The best way is to scoop out sufficient of the leaf to remove with it one bunch of prickles at a time. I question whether women, however active, can prepare 125 lbs. in a day (as in the recent Madras experiment) of the pear which grows on the poor land of the Deccan. Three prepared leaves average about one pound in weight. I offered 2 annas per 50 lbs., but there is no great want of other work here, and although several women of the Dàpodi village attempted the work, none would continue it. The thorns stick in their cloths, and until the worker gets expert, the work is disagreeable.

A garden hand at Rs. 8 per month removed the prickles from forty-five lbs. of pear per day, chopped up the prepared leaf fine, and gave it to the three cattle at two meals—the first meal at 7 o'clock in the morning, second at 5 o'clock in the evening—7½ lbs. to each animal each time. A pinch of salt, and during the first part of the experiment, 1½ lbs. of mixed dàl husk and bran was allowed daily to each animal. This was mixed well through the pear. When the pear prepared in this manner was all eaten the cattle were each allowed 4 lbs. of hay, given at about 7 o'clock in the evening. They were kept tied up out of sight of the other cattle. Water was offered in a bucket three times a day. One buffalo took to the food at once. All ate it greedily after two days, and thereafter up to the end of the experiment. During the first four days no hay was given. Afterwards 4 lbs. per day was allowed to each animal. Not a scrap of hay or prepared food was wasted. Everything was eaten up clean. Every second day the cattle were taken out for a little exercise. During the last fortnight they drank a good deal of water owing to the heat of the weather.

The attendant had to walk about a mile to get the pear. He prepared it where it grew, taking from 6 to 7 hours to get the 45 lbs.

During the last week of the experiment the allowance of bran and chuni was discontinued, only a pinch of salt being added to the prepared pear; the cattle still continued to eat it greedily. On the 28th March the cattle were weighed. There was an aggregate increase of 41 lbs., two increasing little in weight, while the third had thriven considerably. I do not attach much importance to the increase in weight, because the cattle were drinking a good deal more water latterly than they did to begin with; but as one intimately acquainted with the appearance of farm stock, I can without any hesitation say that the three animals had the appearance of thriving throughout the experiment.

Regarding the rate at which prickly-pear can be prepared as cattle food, I have made careful experiment, and with leaves weighing 3 to 1 the lb., 1 lb. in 7½ minutes is good practice, and 70 lbs. per day very good work.

During the first few days of the experiment, while the cattle were fed on prickly-pear without hay, it was noticeable that all three animals were inclined to scour. The inference is that prickly-pear alone is a too laxative food.

Two days after the experiment was completed, the same cattle were offered a feed each of prickly-pear at the same time as the evening allowance of hay was given. They ate the pear but preferred the hay.

## POULTRY PICKINGS.

(*From Various Sources.*)

Mr. VanDresser, the well-known poultry expert, is reported to have made a discovery of the greatest interest to the poultry business, namely, how to make hens moult out of season. Shortly explained the process is as follows:—For two weeks the hens are shut up in their pens and fed only one quarter of a full ration. This reduces their flesh. Then they are let out into the sunshine and open air, and fed with a rush on the best possible food, all they can eat, peas, corn, &c., but particularly sunflower seed. This soon loosens up the old feathers, and they drop off so fast as to leave the hens almost bare. Under this heavy feeding the birds soon take on new plumage and the reddening of the comb which gives promise of fruitfulness.

If your fowls or chickens look mopy or are not doing well give them an occassional dose of Epsom salts. This is good for bowel trouble in young chicks, for hens that have had too much grain and not enough green stuff and meat food, and for over-fat hens. A tea spoonfull makes a full dose for two hens, six half-grown chicks, ten chicks from one to two months old, or twenty chicks a week or two old. The best way to give the salts is to dissolve it in the water you mix the soft food with. It cools the blood, soothes the irritated coat of the stomach where the bowel trouble is presented, and gives tone to the system.

Two troublesome intestinal poultry worms are the white worms scientifically known as *Heterakis papillosa* and *inflexa*. This tiny white or creamy creatures chiefly occur in the duodenum in groups of 10 or 15, sometimes forming a plug which blocks up the alimentary canal. Affected birds have usually ravenous appetites and yet keep losing condition. In length the worms vary from ⅓ to ⅔ in. in the case of *H. papillosa* and from 1 to 4 in. in *H. inflexa*. The eggs or embryos are probaby taken in with dirty water but also off the ground. Diseased birds should be isolated and the worms expelled by a dose of thymol, one grain made up in a dough pill and given morning and night. Sometimes 3 grains santonine are used for expelling the worms.

Nothing can completely take the place of meat or milk in feeding poultry. Milk when given liberally, is a good substitute for meat, but no combination of grains or meals will take the place of either. All table scraps, offal, &c., are quickly

converted into a cash bringing commodity in the shape of eggs.

Keep chickens moderately hungry all day, but late in the evening give then all the grain they will eatup clean, and a little more will not hurt, for what they leave at night they will eat next morning for an early breakfast, which will keep them quiet until they are allowed out.

Some recognise the importance of supplying grit to fowls, while others do not know that such a thing is necessary for the fowls' health and profit. Without grit the birds will have poor digestion, and a yard of hens with poor digestion is an unprofitable possession.

## EDIBLE CONVOLVULACEAE.

The edible character of many *Convolvulaceae* is noticeable, though they do not constitute a very important item of diet. Among the Ipomoeas we have *I. muricata*, the native Alanga which has very characteristic pseudo-prickles on its twining stem. Alanga is a wholesome vegetable with a pleasant nutty flavour, and when taken very young forms an excellent ingredient in pickles. The vine is a very prolific bearer. We may here mention that the larger fruits of *I. bonanox* (producing the beautiful white moon flower) are also eaten, though to a less extent.

Perhaps we should have first mentioned another Ipomoea as the chief among edible Convolvulaceæ, viz., *I. batatas* (*Batatas edulis*) which is so largely cultivated in all the warmer parts of the globe and used as food for man and horses.

A third Ipomoea is *I. aquatica*, a favourite as a native spinach, and known locally as "kaukun" supposed to be its Malay name.

While in the Ratnapura district we heard of, but did not see, a plant called "Màdu" said to be a good standby fodder, and even eaten boiled by people.

Mr. W. A. de Silva informs us that the leaves probably contain a good deal of starch and have a pleasant taste ; and refers us to three species, viz., *I. cymosa* (Maha-madu or Kiri-madu), *I. tridentata* (Hawari-madu), and *I. angustifolia* (Hin-madu). Mr. Silva is good enough to write with reference to this subject : *I. uniflora* (Potupala) is used for curry, and so are *I. chryseides* (Kaha tel-kola) and *I. sepiaria* (Rasa tel-kola). The two latter as their names imply are of an oily or fatty character.

## NATURE STUDY LESSONS.

### SECOND COURSE IN THE STUDY OF PLANT LIFE.

### 3. THE LEAVES.

The surface of leaves, above and below, is covered with a very thin skin which, in some cases, can be peeled off, as in American aloe (gonigas). This skin may be looked upon as a waterproof covering, protecting the leaf in the same way as the outer bark protects the stem.

Scattered throughout this outer skin or epidermis are—especially on the underside—numerous minute openings through which gases from the air can pass in and out. The interior of the leaf consists of soft and spongy tissue, in the cells of which certain important changes are brought about. Running through the soft tissue are the veins (best seen when a leaf is held up to the light) forming a sort of ground-work or skeleton. You will sometimes find, lying under a tree, leaves that have been reduced to skeletons by the decay of the softer tissues. The veins themselves are tough, being continuations of the woody tissue of the stem, and serve to carry the liquid food (ascending sap) to the leaves.

In a large class of plants the leaves show a netted arrangement of the veins, which are irregularly spread over the blade. In another large class the veins run parallel to one another. Compare the leaf of the mango or orange with that of the plantain.

You will now be thinking that there must be some important work going on within the leaf, seeing that the liquid food, absorbed through the roots as well as the gases that enter through the leaves, ultimately find their way there. So there is ; and, in fact, the leaf is sometimes spoken of as the laboratory (or workshop) of the plant, because it is there that crude plant food is prepared, or brought into a fit condition to serve as nutriment to the plant, just as our food requires to undergo various changes before it can be assimulated. The elements of plant food derived from the soil, and those derived from the atmosphere combine to form compounds capable of nourishing the plant.

You now know something of the important functions performed by leaves in connection with plant nutrition, but it is also through the agency of leaves that the process of respiration is carried on. Plants, you must know, breathe just in the same way as animals. That is to say, they take up the life-giving oxygen from the air, and give out poisonous carbonic acid gas. This goes on through those minute openings we have already referred to (known as stomata) which may be looked upon as the leaf-mouths of the plant.

You will recollect that, in speaking of the upward flow of the crude sap through the wood tissue of the stem, we made reference to the large quantity of water that passes out of the plant, through the leaves, in the form of vapour. This process, called transpiration, is also carried on through the stomata.

So that the leaves, as you see, have very important functions to perform in connection with nutrition, respiration, and transpiration, about which I shall have more to tell you later.

Many species of leaves serve as human food such as cabbage (gowa) and lettuce (salada), but, besides such well-known vegetables, there are a large number of uncultivated plants, the leaves of which are used in this country, such as *Ærua* (polkudu-pala) and other wild forms of vegetation which come in very handy for village diet.

As instances of medicinal leaves, I may mention the species of Cassia which yield the English drug

called senna, and Herpestis (lunuwila) so well known in native medicine. Examples of dye producing leaves are Indigo (nil-awari) and Memecylon (weli-kaha), which respectively yield blue and yellow dyes.

Tea leaves deserve to be specially mentioned owing to the extensive use of the prepared leaf as a standard beverage.

Oil is got from certain leaves such as those of the Cinnamon tree (kurundu) and Citronella grass (pangiri-mana).

The value of the leaves of many grasses as cattle food needs only to be mentioned to you. Of cultivated fodders we have in Ceylon only two, viz., Mauritius or watergrass (diya-tanakola) and Guinea-grass (rata-tana).

Of leaf fibres you have a very good instance in bowstring hemp (niyanda), while the coconut and palmyrah palm furnish examples of the special uses which leaves are put to in the tropics, such as for thatching, for mats, baskets, fans, brooms, and so on.

There is a peculiar class of plants (in which am sure you will be greatly interested) that have leaves of a special structure with special functions to perform. These are the plants which are able to capture, and, so to speak, devour insects. For the present I just wish to introduce two rather common plants of this class to you. One is the pitcher plant (bandura wel), in which the so-called pitcher is nothing more than a transformed leaf. Get a specimen, examine it carefully, and prove this for yourself. Some people fancy that the fluid in the pitcher is rain water. This is not so, as you will find pitchers with the lids still unopened, containing fluid, which is thus clearly supplied by the plant itself. Look for insects that have been drowned by falling into open pitchers. The lid is not, as some think, part of a trap for capturing, and the insects die through drowning in the irritating fluid into which they fall in their search for food. The peculiar structure of the leaf aids in their destruction.

Another of these plants, found also in damp sandy places, is the Drosera (wattaessa). The structure of the leaf is not so peculiar, but you will find the surface covered with stiffish red hairs which close on insects like so many fingers, and retain a hold on them till they are killed. Look for insects on the leaves of the Drosera. I am sure you will think these leaves very beautiful, with little drops of fluid at the ends of the red hairs, glistening like dew in the sun. Thus it is that the plant gets its name 'Sun-Dew."

## DISEASES INCIDENTAL TO PREGNANCY—AND PARTURITION IN THE COW.

[H. M. Crichton, M.R.C.S.V.]

### Parturient Eclampsia.

*Definition.*—An epileptic and convulsive affection, affecting the cerebro-spinal nervous system accompanied by tonic and clonic spasms of the muscles of various regions of the body. It occurs in cows both before and after parturition.

*Causes.*—Opinions differ in regard to the cause; by some it is supposed to be due to the retention of urinary elements in the blood, by others to hyperæmia of the brain, and by others still to reflex irritation of nervous system, which bring about renal insufficiency and albuminuria, and exposure to cold winds and wet may bring on the disease.

*Symptoms:*—The cow takes suddenly ill by foaming at the mouth, champing the jaws, full wild staring eyes, excited expression of countenance, head turned to the side, sometimes pulling back on the chain, licking at fore leg, edge of feeding trough, or anywhere convenient; some cows bellow, others don't; twitching of the muscles of body and limbs, sometimes difficulty of respiration, sometimes cow becomes comatose. Most cases occur after calving, those which occur before are generally about mid-term, and in heifers. The attacks after calving generally occur from eight to sixteen days afterwards. The disease occurs in cows of all ages, and generally in cows of lean condition. The reverse to this happens in parturient apoplexy, as it is a fat cow and a good milker that goes down with it. The most of cases do not get off their feet, although I have had them that did, and lay for a night before getting up again. It might be possible to confound this disease with parturient apoplexy, but if we are careful to note the symptoms it should not happen. I will endeavour to point out the essential differences between the symptoms of the one and the other. There are about eight prominent symptoms that we should bear in mind when we are called in to see cases of this description. I will enumerate them as follows:—

*Parturient Apoplexy.*

It mostly occurs in cows at third calving and afterwards.

It never occurs before calving, and generally within forty-eight hours thereof.

One attack predisposes to another one.

Most common in fat cows.

Patient fails to keep standing.

Rapidly followed by coma.

Earliest period of recovery is generally eight to sixteen hours.

Prognosis generally very unfavourable till Schmidt treatment found out; now more favourable.

*Parturient Eclampsia.*

Occurs in cows of all ages, but mostly at first and second calving.

Occurs in cows before calving; if after calving hardly ever before the eighth to sixteenth days.

One attack not necessarily succeeded by another at next calving.

Most common in lean cows.

Patient mostly can stand through attack.

The cow only occasionally becomes comatose.

Recovery takes place in a few hours generally.

Prognosis favourable and the treatment successful.

Now, gentlemen, these are the principal features in contrasting these two diseases, and I will now give you the most successful treatment that I

have found for this disease after trying several remedies.

*Treatment.*—First get the cow made comfortable in a good warm box or byre free from draughts, and as the morbid condition of the nervous system may be brought about by cold winds, wet, or draught, it is necessary to do this most needful part of the treatment. Then if the bowels are correct I give no laxative, but prescribe from ʒiss. to ʒii. ext. belladonna every three hours as long as necessary; bleeding may be resorted to if the foregoing treatment fails, but this is not usually the case. If kidneys don't act promptly and sufficiently I prescribe ʒii. spt. ether nit. in a little cold water, or along with the ext. belladonna; give about two quarts of linseed tea every few hours if the animal will have it, and this is usually all that is necessary for the treatment.—*Veterinary Journal.*

(*To be continued.*)

## THE JACK (*ARTOCARPUS INTEGRIFOLIA*).

The acting Director of the Royal Botanic Gardens (Mr. J. B. Carruthers, F.L.S.), lately delivered a lecture entitled "The Story of the Jak Tree." The tree known in Sinhalese as *Kos* and in Tamil as *Pila*—was, however, taken to serve as a tropical specimen to illustrate a lesson on plant life. The account we give below is on the other hand a very complete account of the Jak and its uses. It is taken from the *Queensland Agricutural Gazette* and was written by the Manager of the State Nursery, Kamerunga, Cairns. As dealing with one of our commonest trees it should be of local interest, while our readers will find that there is something new in the article:—

The Jackfruit (*Artocarpus integrifolia*, Linn,) is of the same family and the nearest known relative of the famous Breadfruit (*A incsa*). The name *Artocarpus* is derived from two Greek words literally translated, viz., *Artos*, bread; and *Carpos*, fruit, and its second name is purely botanical, *integrifolia* meaning entire leaved to distinguish it from *A. incisa,* the cut or incised leaved Breadfruit.

The Jack fruit, being of a much darker green, and having very much smaller leaves, and often being quite a different shape and size, the similarity of the two trees will often not be commonly apparent.

There are several allied species, as *A. Lakoochia, A. Chaplasha, A. Hirsuta,** about which very little would seem to be known, and which do not appear to have an econcmic value proportionate to the two species mentioned. The Jack is a native of East India and the South Seas, inhabiting countries with a hot and moist climate, and is essentially a tropical tree. It will not generally thrive in a locality subject to strong winds, as it is somewhat brittle, and will not stand severe frost, though much hardier in this respect than the Breadfruit.

*And in Ceylon *A. nobilis* which gives us a useful timber, and the seeds of which are roasted and eaten.—*Ed. A.M.*

It is an umbrageous or thick foliaged tree and an evergreen. One tree exists in this Nursery which is thriving particularly well, having ieadily adapted itself to the climatic conditions obtaining here. An illustration accompanies this article. The tree shown is about ten years old, and 35 to 40 feeet in height; it has been in bearing four years or so. During the last season it bore a heavy crop of fifty or sixty fruit, averaging in weight from 5 to 10 or 12 lb.

I have observed a few trees here and there in North Queensland, mostly in old gardens where presumably it was grown more as a curiosity than for use; in any case very little advantage would seem to be taken of its useful properties. Several varieties of the tree exist, and some were probably introduced into Queensland at one time, though I have not yet met with more than one variety, which is by no means the best. The better varieties are known as the "Honey Jack" in India and Java, from the sweet syrup that is to be found within the pulp round the seed, and the "Root-bearing Jack," which produces its fruit entirely or partially underground. This latter is a specially fine fruit, and much valued in the Orient. Some writers seem to be of opinion that old trees of the ordinary or "Honey Jack" variety will bear fruit upon their roots in this way, but this is not authenticated. The root-cropping tree is generally considered a separate variety, and though I have seen, sown and cultivated thousands of these trees, have never yet seen an ordinary Jack that will do this from mere age. This root-bearing may, however, be brought about by artifical treatment occasionallly, which methods I will describe later.

Another variety of the species is the "Wild Jack," which is a much larger tree than the cultivated or sweet one. The fruit is smaller, and though sweet, not so pleasant; the tree itself, however, is more spreading, contains more timber, and as a fodder tree is the more useful of the two.

The fruit of the Jack tree is oval or oblong, is muricated on the rind, and of a bright green colour, turning slightly darker or duller when approaching ripeness, but never becoming quite yellow. When opened it is white inside; the inner pulp or edible parts are separately attached to the centre core, and surrounded by or packed in viscid fibres. Each piece of pulp is about the size of an egg plum, pale yellow in colour, and contains one seed.

The tree, like the cocoa, bears its fruit upon the stem and thicker branches. The fruit has a somewhat strong scent, which is intensified if allowed to become over-ripe. The smell is disliked by some, but on becoming accustomed to it or on tasting the fruit, it ceases to be offensive or even noticeable.

The tree is very prolific, and the fruit often attains tremendous size and weight—fruit of 80 lb. have occasionally been met with. In Southern India I have obtained fifty to seventy fruit from one tree, and myself cut a specimen weighing 70 lb.

In Queensland, however, I have not met with any large specimens—the average would seem to be from 5 to 10 lb., although one fruit of 23 lb. is on record.

The tree comes into bearing here in three to four years, and while large fruit will contain as many as 200 seeds, ten to twelve seeds per fruit is more common. The croping season is also very short in this State, usually lasting less than two months between January and March.

The fruit is distinctly palatable and is wholesome and nutritious. The smell, however, is apt to prejudice one against it on tasting it for the first time, and if, in ignorance, an over-ripe fruit is opened, not only is the smell intensified and rendered disagreeable, but the fruit is not so nice flavoured, for, like the Durian, to which it is sometimes likened, it must be taken at the right degree of ripeness to be appreciated.

If these over-ripe fruit are removed or buried, the smell is really no stronger than that of the mango, and not as disagreeable. To judge a ripe Jackfruit, however, needs a little practice, for one cannot judge by colour. The usual method is to tap the fruit or flip it with the finger, when the hollowness of the sound denotes the degree of ripeness.

The white milky juice, which is very sticky, renders an unripe fruit uneatable, and in an over-ripe one, the stringyness as well as strong smell makes it equally unpalatable. An ideal fruit should have the pulp firm but neither soft nor hard, and a pale yellow colour, when it will be found sweet and of a most agreeable flavour.

In its native countries the fruit is considered a delicacy; natives will pay 1s. to 1s. 4d. each for them, and Europeans become exceedingly fond of them. The pulp may also be cooked in various ways; I have had it boiled in milk, cooked in custards, fried in butter, and preserved in honey. In the latter form it is an excellent dessert. Bernays, in his "Cultural Industries," gives a receipt for boiling in milk, from which, however, the pulp would subsequently seem to be strained off.

In opening a fruit, the rind, which is about half-an-inch thick, should be cut through and the fruit then broken open. The pulp sacs containing the seed may then be picked out from the surrounding fibres. These should at once be cut open, the seed taken out, and put into a basin of water. The addition of a very little salt to the water improves them, and, it is said, eliminates what little smell may remain. If strained and served up promptly with icing sugar sifted over, they are not only palatable but excellent eating and quite odourless.

However, although it cannot be said that in this case "all love Jack," still all concur in attesting to the excellence of the nuts when roasted. These may be roasted like English chestnuts, which they much resemble, or boiled and used in curries or stews. After being boiled they are sometimes dried and ground, and cakes and nutritious farinaceous foods made from the flour.

*(To be Concluded.)*

## GENERAL ITEMS.

*The Station, Farm and Dairy* referring to the value of manures and the conservatism of some cultivators who are prejudiced against them, says:—If Agriculturists continue to refuse the teaching of their fellowman, the least they should do is to give up farming, for unquestionably such men do not deserve the name of agriculturists, and by keeping to it they merely drag the name in the mud.

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The same paper referring to Sunflower cultivation in Russia, says:—The industry which is stated to be very remunerative is rapidly increasing in proportions, and promises to still further develope before long. It is claimed that the sale of the oil-cake produced, in itself more than covers all the working expenditure of the mills. The stalks of the plant are used as fuel for driving the machinery, and the ash that remains gives from 25 to 30 per cent of potash. Briefly speaking, it would appear that the sunflower seed, when properly crushed, gives 23 per cent oil, 40 per cent cake, and 37 per cent stalk.

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"Sunlight Oil Cake," advertised as the best food for stock and poultry, is nothing more than "Coconut poonac," the residual cake after the express from copra of the oil used in the manufacture of sunlight soap. The wonder is that there is no local firm manufacturing soap. Messrs. Freudenberg & Co. did a business in coconut oil soap some years ago, but we believe they have given up the manufacture now.

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Have any of our readers come across plantain trees bearing bunches of fruit about a yard from the ground? This is said to be as common in lower Bengal, especially in the variety known as "Beejee-kela."

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The German Emperor has determined to help the agriculture of his own country by opening a new career for the potato. With this object he is doing all he can to extend the use of potato alcohol as fuel. He has already induced a number of firms, including that of Herr Krupp, to adopt potato alcohol for their motors.

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To keep fruit trees clean of pests a correspondent to the *Queensland Agricultural Journal* recommends the following treatment:—"The soil about the roots of the trees was removed as far as the roots went, so that they were laid bare. Woodhouses dry and well preserved were strewn over the exposed roots and kerosine spinkled over afterwards. The soil was then returned to its place. The trunks were tarred to the height of one foot, and beyond that washed with kerosine and warm water. At the same time the upper trunk and the limbs as far as convenient were whitewashed. All this need only be done when the trees have started budding." With a few valuable fruit trees this may be possible, and will be compensated for the fine yield of good fruit; but for large areas some modification of the above elaborate plan would have to be adopted, and may still be found beneficial.